

## Section 19 Flood Investigation Report

**Date:** 3<sup>rd</sup> July 2025

Section 19 Flood Investigation Report: Adderbury

Dates of Flood Incidents: 23<sup>rd</sup> September 2024 and 24<sup>th</sup> November 2024

### Revision Schedule

Version	Date	Details	Author	Checked	Approved
1	20/05/2025	Adderbury Draft Flood Investigation Report	N Cain	T Luck	T Byres
2	03/06/2025	Adderbury Draft Flood Investigation Report for RMA comment	N Cain	T Luck	T Byres
3	03/07/2025	Final	N Cain	T Luck	T Byres
4	15/07/2025	Updated comment based on Parish Council feedback	N Cain	A Dimaline	C Mills

## Executive Summary

This Section 19 (S19) Flood Investigation Report has been issued by Oxfordshire County Council (OCC) in its capacity as Lead Local Flood Authority (LLFA). It is based upon an investigation by OCC and Cherwell District Council (CDC) into the flooding that occurred in Adderbury during September and November 2024.

## Flood Events

Up to 23 properties were reported to have flooded internally within Adderbury on the 23<sup>rd</sup> September and / or 24<sup>th</sup> of November 2024. As such, the flooding met the OCC threshold for undertaking a formal investigation (*Internal flooding (excluding to basements) to five or more residential properties or businesses within an area of 1km<sup>2</sup>*). The flooding resulted in properties being uninhabitable.

Flooding was reported to have occurred on the 23<sup>rd</sup> of September 2024 and the 24<sup>th</sup> of November 2024 within Adderbury due to raised river levels in the Sor Brook, and its bifurcated channel known as the Mill Stream, which flows adjacent to the properties through Adderbury. Raised river levels followed two periods of unprecedentedly high rainfall in late September and November 2024.

This rainfall peaked on the 23<sup>rd</sup> of September when daily rainfall reached its third highest ever recorded level of 71mm (since records began in May 1989) at the Grimsbury (Banbury) rainfall gauge. Rainfall was also heavy during the November event, but the main area of note was the exceedingly high flow in the channel at the Bodicote flow gauge, which peaked at 16.5m<sup>3</sup>s<sup>-1</sup> on the 24<sup>th</sup> November.

The heavy rainfall fell over a relatively short period, leading to increased river levels and surface water runoff. The sheer volume of water caused the channel to reach its capacity and overtop the banks at several locations. The channel exceedance also prevented additional surface water from entering the channel and draining away. Additional surface water flooding also occurred away from the Sor Brook, at locations around Tanners Lane, Partridge Court and Round Close Road. Flooding in these locations was due to the volume of surface water runoff exceeding the drainage capacity.

This report provides a number of recommendations aimed at maintaining current systems, increasing preparedness, and identifying potential solutions to mitigate future risks; these recommendations are summarised below.



## Main Recommendations

Recommendation	Lead Stakeholders	Consulting stakeholders
<p>Residents and the Parish Council to set up a flood action group.</p> <p>Through this action group, discuss the issues and recommendations from this S19 report.</p> <p>With support from CDC &amp; OCC develop emergency resilience plans.</p>	Residents, Parish Council	OCC LLFA, CDC,
<p>Residents to sign up for Flood Alerts and Warnings and develop a personal flood plan.</p> <p>Guidance on this can be found at:  <a href="#">Oxfordshire County Council – Flood Toolkit</a></p>	Residents	Parish Council, CDC, OCC LLFA
<p>Parish Council / landowners to review the feasibility of constructing two new sections of channel to alleviate flood water pressure away from key stress areas. The first being a relief channel to ‘cut’ the meander downstream of Dog Close bridge; the second to remove flow from the Mill Stream upstream of the Mill House towards the Sor Brook and the playing fields floodplain.</p>	Parish Council/ Landowners	EA, OCC LLFA, CDC
<p>Owner of the Old Mill House to discuss with the Environment Agency the feasibility of works to improve capacity through the side sluice.</p>	Landowner, EA	OCC LLFA, CDC
<p>Parish Council and residents to continue with the construction of the relief trench currently being dug to release flow away from Dog Close and back into the Sor Brook.</p>	Parish council, Residents	CDC, OCC LLFA, EA
<p>Landowner to discuss with the Environment Agency the feasibility of raising the RHB of the Mill Stream between Water Lane and Church Bridge, ensuring that flood risk isn’t transferred elsewhere.</p>	Landowner, EA	OCC LLFA, CDC
<p>Environment Agency to consider using their permissive powers under the Land Drainage Act 1991 to ensure riparian owners along the Main River carry out required channel maintenance.</p>	EA	Landowners CDC
<p>OCC LLFA and Environment Agency to work with landowners to discuss willingness for natural flood management (NFM) measures to be implemented</p>	OCC LLFA, EA	Landowners, Parish Council, CDC



on rural land upstream of Adderbury to slow and / or attenuate flows.		
Environment Agency to explore the feasibility of implementing upstream flood alleviation measures to attenuate peak flows reaching the Sor Brook at Adderbury.	EA	OCC LLFA, CDC, Landowners Parish Council
OCC Highways to review the current maintenance programme for their drainage assets in Adderbury, and look to increase the frequency of cleaning, in line with current Countywide Highway Maintenance Programme and funding availability.	OCC Highways	
<p>OCC Highways, CDC and Partridge Court landowner to explore possible causes of limited network capacity, which may have contributed to the internal property flooding in:</p> <ul style="list-style-type: none"> <li>• Round Close Road</li> <li>• Tanners Close</li> <li>• Partridge Court</li> </ul> <p>Investigations to include a camera surveys of highway gullies and the main pipe from Round Close Road through to the playing fields. Investigations to identify recommendations for potential network improvements.</p>	OCC Highways, CDC, Partridge Court landowner	OCC LLFA Parish Council
Thames Water to consider the viability of options for adjusting the position of their pipe on the downstream side of Dog Close Bridge to reduce the risk of debris blocking the bridge and channel.	Thames Water	CDC, OCC LLFA
Thames Water to conduct ongoing and regular maintenance of Thames Water assets. This could involve regular checks for blockages in the system, considering repairs to any damaged structures to reduce the risk of surcharge and identifying area parts of their network that may be undercapacity.	Thames Water	
CDC and the Partridge Court landowner to explore the feasibility of formalising a flow route from Partridge Court car park to the open ditch behind the properties in Round Close Road, to alleviate the ponding of water in Partridge Court car park.	CDC Partridge Court landowner	OCC LLFA Parish Council
OCC LLFA to explore the spring flows emerging from the north side of Round Close Road and	OCC LLFA	OCC Highways, CDC

possible ways to formalise the routing of these flows into the drainage network.		
<p>Explore the willingness to implement property flood resilience measures (PFR). Guidance on PFR measures can be viewed through Ciria document (C790F) and a link to this document is provided below:</p> <p><a href="https://www.ciria.org/ItemDetail?iProductCode=C790F&amp;Category=FREEPUBS&amp;WebsiteKey=3f18c87a-d62b-4eca-8ef4-9b09309c1c91">https://www.ciria.org/ItemDetail?iProductCode=C790F&amp;Category=FREEPUBS&amp;WebsiteKey=3f18c87a-d62b-4eca-8ef4-9b09309c1c91</a></p> <p>Funding in the form of grants, may be available to support the property owners in delivering PFR measures – see Section 5.1.</p>	Property owners	OCC LLFA, CDC, Parish Council

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## 1. INTRODUCTION

### 1.1. Lead Local Flood Authority (LLFA) Investigation

Section 19 of the Flood and Water Management Act (F&WMA) states:

- 1) On becoming aware of a flood in its area, a LLFA must, to the extent that it considers it necessary or appropriate, investigate: -
  - a. which risk management authorities have relevant flood risk management functions, and
  - b. whether each of those risk management authorities has exercised, or is
  - c. proposing to exercise, those functions in response to the flood.
- 2) Where an authority carries out an investigation under subsection (1) it must: -
  - a. publish the results of its investigation, and
  - b. notify any relevant risk management authorities.

The LLFA have a set criteria which determines when a S19 report is required. The criteria are set out below.

#### **LLFA/OCC Criteria**

- Internal flooding (excluding to basements) to five or more residential properties or businesses within an area of 1km<sup>2</sup>.
- Internal flooding of a business premises employing more than 10 people within an area of 1km<sup>2</sup>.
- Internal flooding (excluding to basements) of at least one property or business for one week or longer.
- Flooding of one or more items of critical infrastructure, which could include hospitals, health centres, clinics, surgeries, colleges, schools, day nurseries, nursing homes, emergency services (police, fire, ambulance) stations, utilities and substations.

#### **Caused a transport link to be impassable:**

- Motorways, trunk roads, Class A and B highway closures shall all be investigated.
- Class C highways – 10 hours or more unless the route is the only means of access or is primary route for critical infrastructure then reduce to 4 hours.
- Class U highways – 24 hours or more unless the route is the only means of access or is primary route for critical infrastructure then reduce to 4 hours.
- All rail link closures shall be investigated.

Any flooding event that a risk management authority deems significant but does not meet the agreed thresholds should be put forward to the Agency flood group meeting for consideration.

## 1.2. Site Location and context

This report relates to flood events in Adderbury (OX17) during September and November of 2024. The village of Adderbury is located within the Cherwell District of Oxfordshire, approximately 5km south of Banbury and 30km North of Oxford (Figure 1). The west and east of Adderbury are divided by the Sor Brook, a tributary of the River Cherwell. Adderbury is the last major settlement that the Sor Brook passes through before reaching its confluence with the River Cherwell.

The main area of concern documented by this Section 19 flood investigation report is Dog Close which is located in the west of the village and beside the right bank of the Sor Brook. There are also some other individual areas of flooding detailed in this report at Round Close Road, Horn Hill Road, Tanners Lane, Partridge Court, Manor Road and The Old Laundry (off Dog Close). See Figure 2 for more detail.

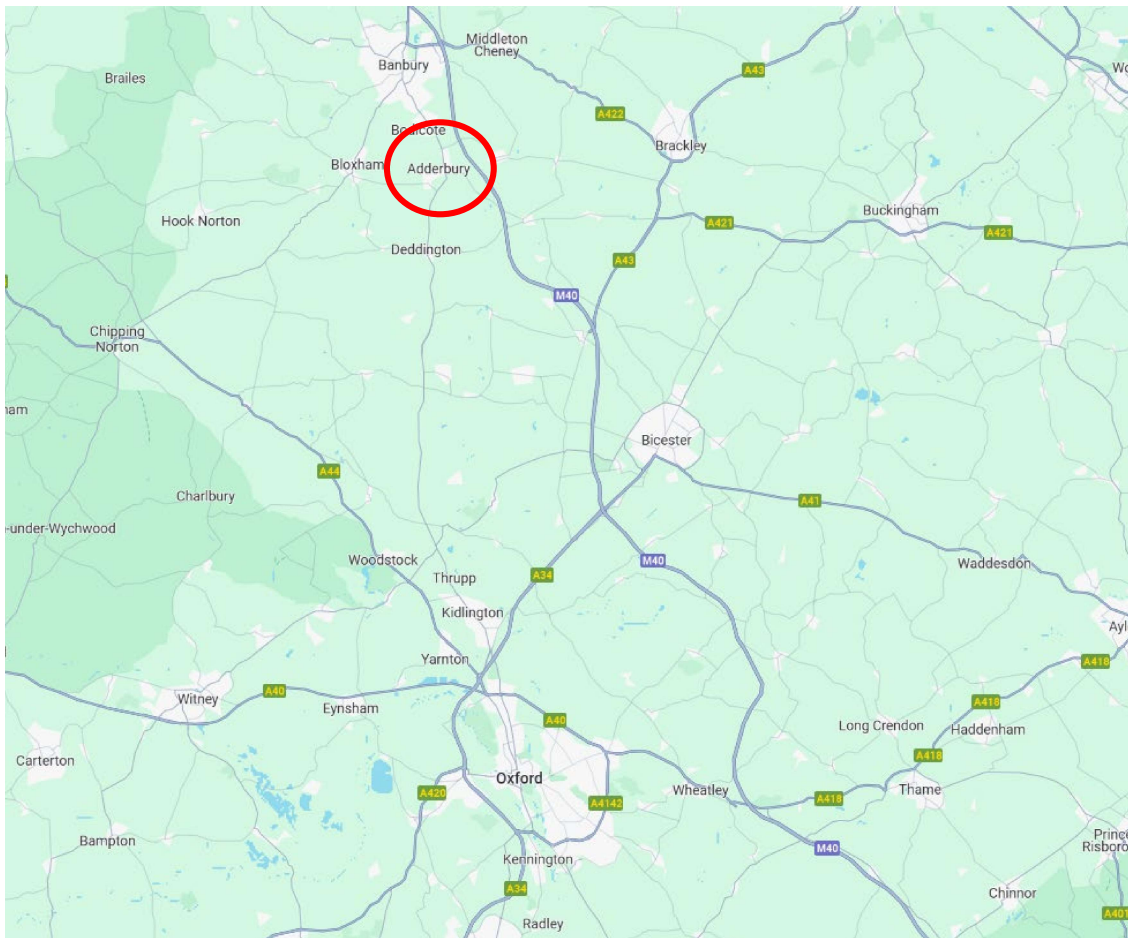


Figure 1 – Adderbury in relation to Oxford and Banbury. (Source Google 2025 [Accessed 18<sup>th</sup> May 2025]).

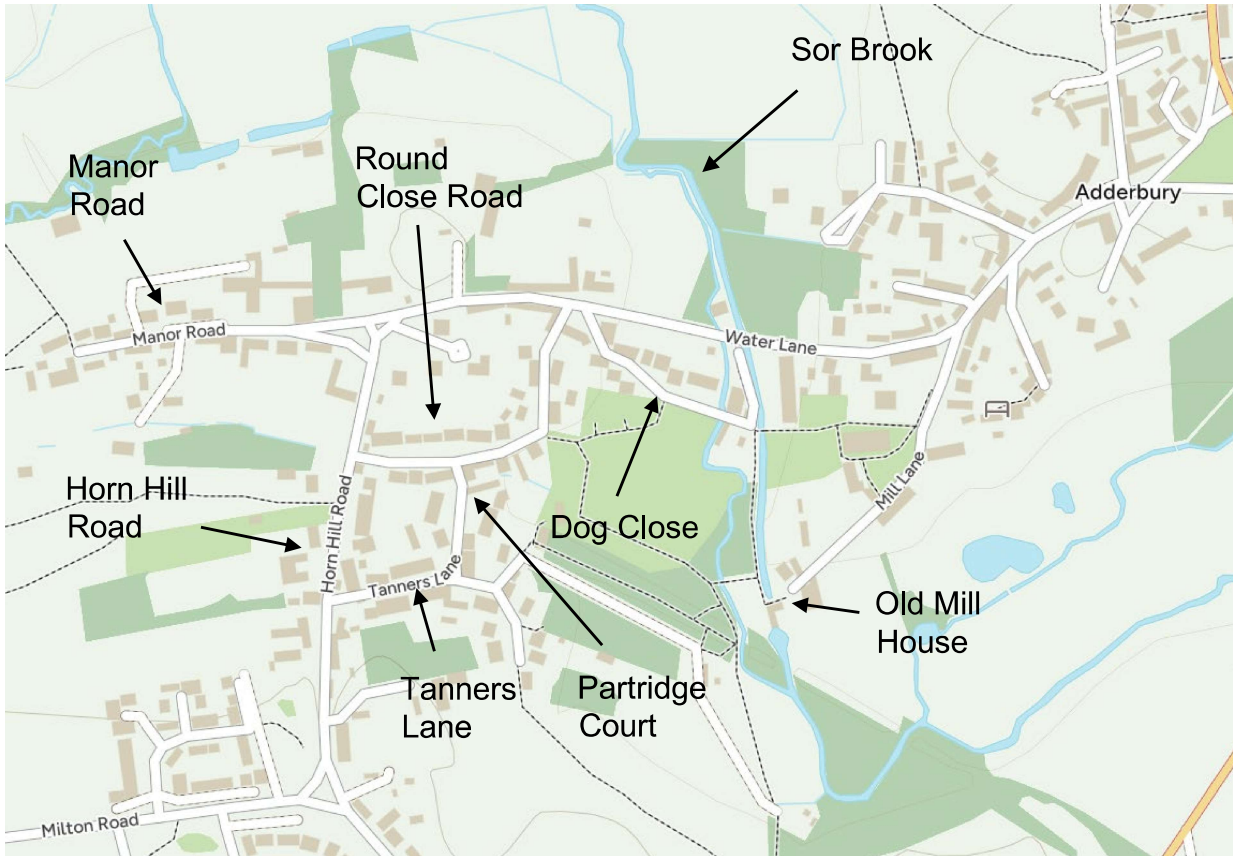


Figure 2 – Sor Brook and the surrounding area of interest within Adderbury. Source OS Maps 2025.

The topography of Adderbury slopes towards the low point of the Sor Brook and its floodplain, with greater elevation either side of the river where the majority of housing is located. It should be noted that the east of Adderbury is at a higher elevation than the west of Adderbury. The disused Cheltenham District Railway is visible as a minor raised section of elevation but is unlikely to have any noticeable impact on the hydrology of the watercourse or its floodplain. Figure 3 shows a topographical map of the town, generated using 2022 1m Light detection and ranging (LiDAR) data. Figure 4 shows a focused LiDAR image of the area that experienced the flooding documented by this report.



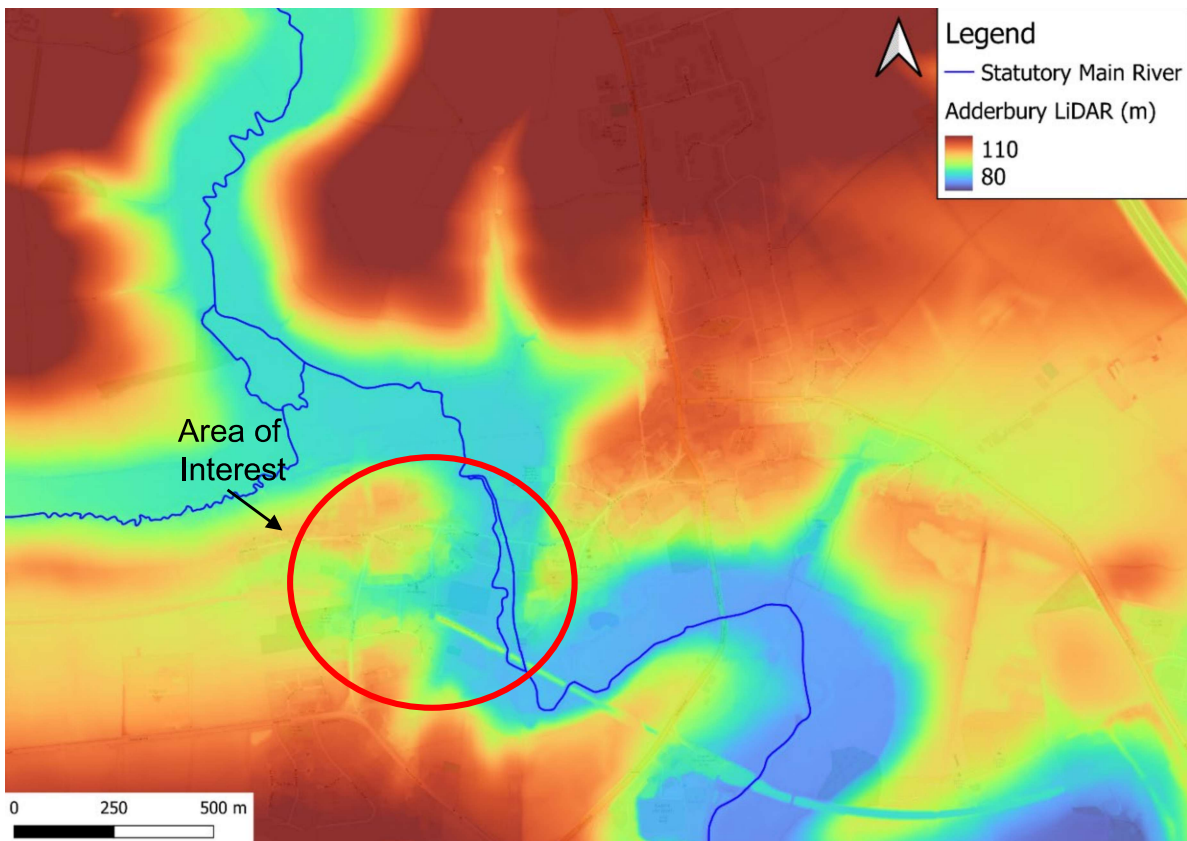


Figure 3 - Adderbury elevation overview generated by LiDAR (Source: DEFRA 2022), including Statutory Main River of Sor Brook

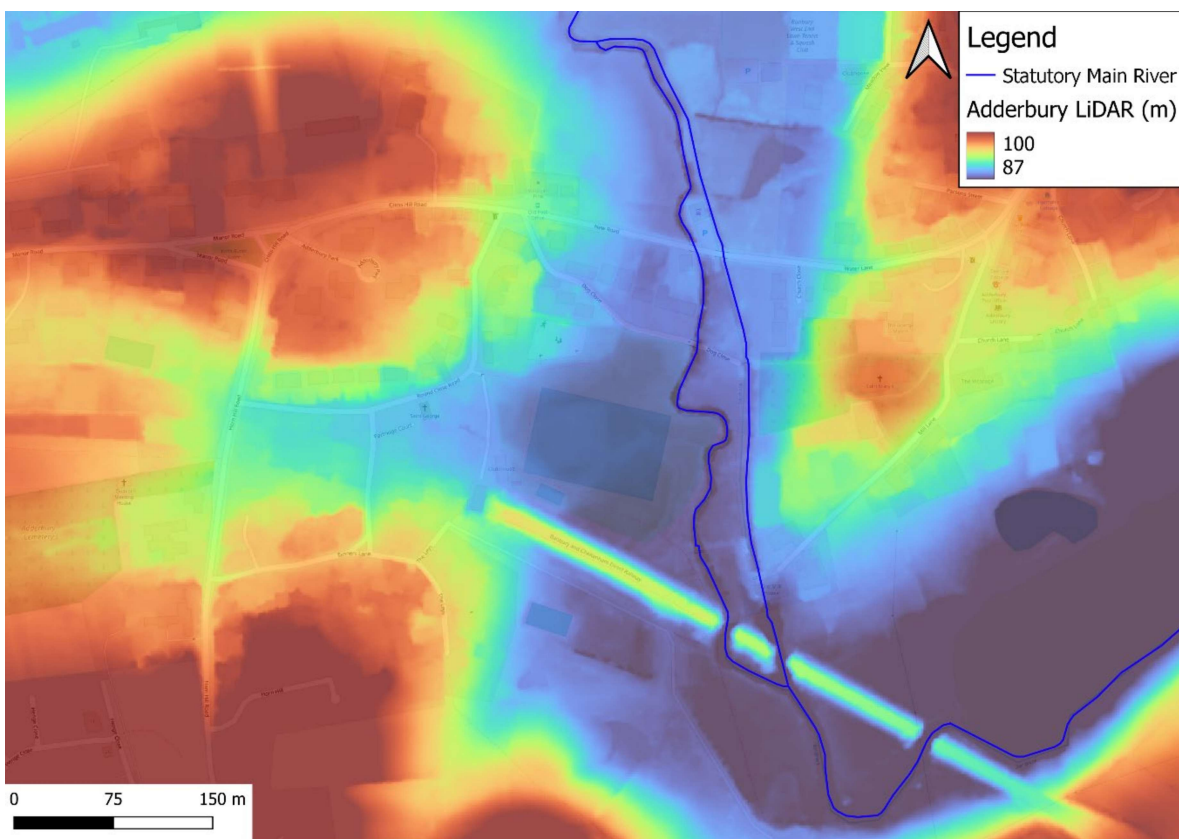


Figure 4 - Area of Interest elevation overview generated by LiDAR (Source: DEFRA 2022), including Statutory Main River of Sor Brook

The Sor Brook divides into 2 distinct watercourses approximately 100m upstream of Adderbury to create a mill stream that leads to a decommissioned Mill House. The artificial watercourse created is named Mill Stream and is reported to carry the majority of the water through this reach of the river. The structure that controls the split of the

watercourses is a simple fixed crest weir. The Mill is no longer in use and the channel under the Mill House is blocked off, with all the flow in the Mill Stream passing through a small sluice and side channel back into the Sor Brook. Figure 5 shows this section of split channel through Adderbury. Note that the statutory Main River map shows the channel to flow underneath the Mill House, but this is no longer the case since the culvert has been closed.

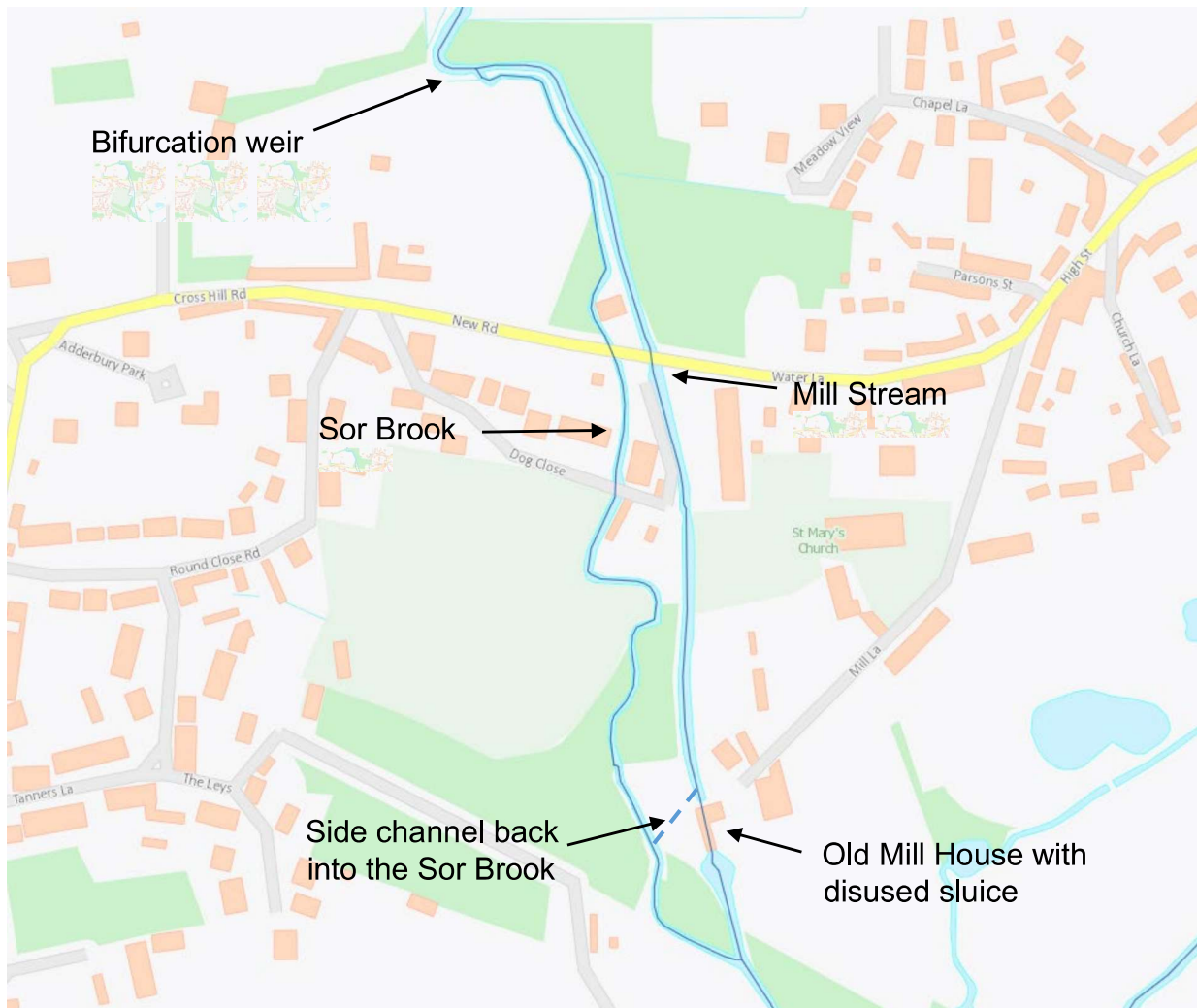


Figure 5 - Main River map showing locations of separation Sor Brook and Mill Leat. (Source OS Maps, Statutory Main River Map 2025.)

The Environment Agency are the lead risk management authority for Main Rivers which are typically larger rivers. In contrast, Ordinary Watercourses are generally smaller rivers, streams, or ditches of which LLFA's are the lead management authority. More information on these classifications can be found in Section 4 of this report. The Sor Brook through Adderbury is classified as Main River.

The catchment area of the Sor Brook (Broughton to Cherwell) WFD Water body which Adderbury sits within is 19.3km<sup>2</sup>. It should be noted, however, that the Sor Brook flows through another catchment – *Sor Brook (Source to Broughton)* (catchment area of 35.62km<sup>2</sup>) – before it enters the downstream catchment. As such, the Sor Brook is draining a considerable area before reaching Adderbury and joining the River Cherwell further downstream.

The upstream areas of both catchments are predominantly rural and characterised by agricultural fields. Once the Sor Brook (and Mill Stream) enter the urbanised section of



Adderbury, the watercourses are contained primarily within artificial channels that seek to convey flow through the village as quickly as possible.

The Environment Agency's Risk of Flooding from Rivers and the Sea (RoFRS) maps indicate the annual chance of flooding from rivers and the sea, considering the presence and condition of flood defences. The region surrounding the Sor Brook, including the eastern end of Dog Close is classified as being at high risk by the ROFRS map (Figure 6), meaning there is a greater than 3.33% annual exceedance probability (AEP) of flooding. This area also includes a significant portion of the playing fields to the south of Dog Close which has been identified as being at a lower elevation than the surrounding area by the LiDAR imagery (Figure 3 and Figure 4).

The Environment Agency's Risk of Flooding from Surface Water (RoFSW) is also considered, especially in the cases of flooding reported on Tanners Lane and Partridge Cort which are at a considerably greater elevation than the Sor Brook. The RoFSW is shown in Figure 7. The same low elevation playing field shows a risk of surface water flooding potential, but the area of most interest is the region surrounding Partridge Court, Round Close Round and the end of Tanners Lane. Some of these areas are at high risk with a greater than 3.33% AEP from surface water flooding. This may go some way to explain the flooding experienced in this region during the flood event detailed in this report. As such, consideration should be given to flooding being caused by both fluvial and surface water contributions.

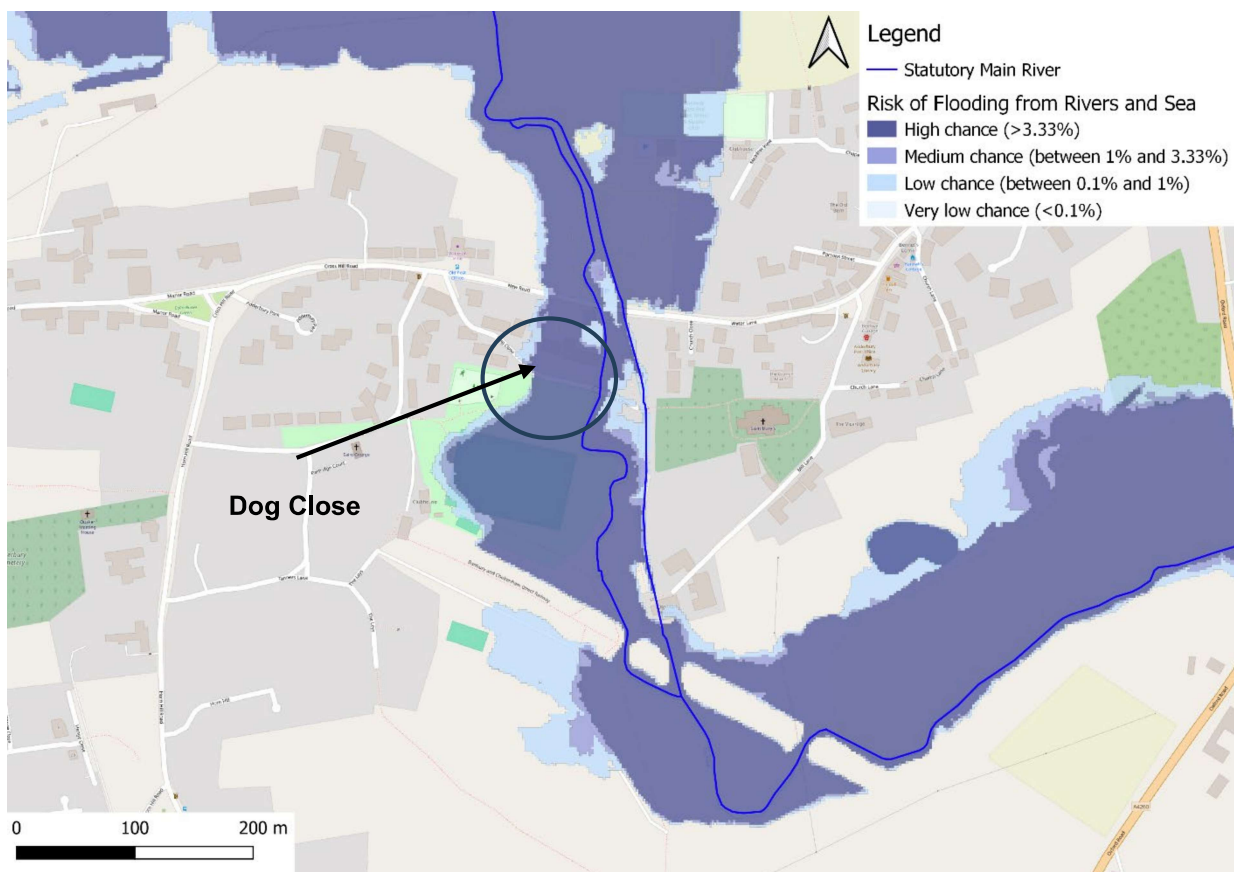


Figure 6 - Main River and Risk of Flooding from Rivers and Sea (RoFRS). Data from the DEFRA Data Services Platform (2025)

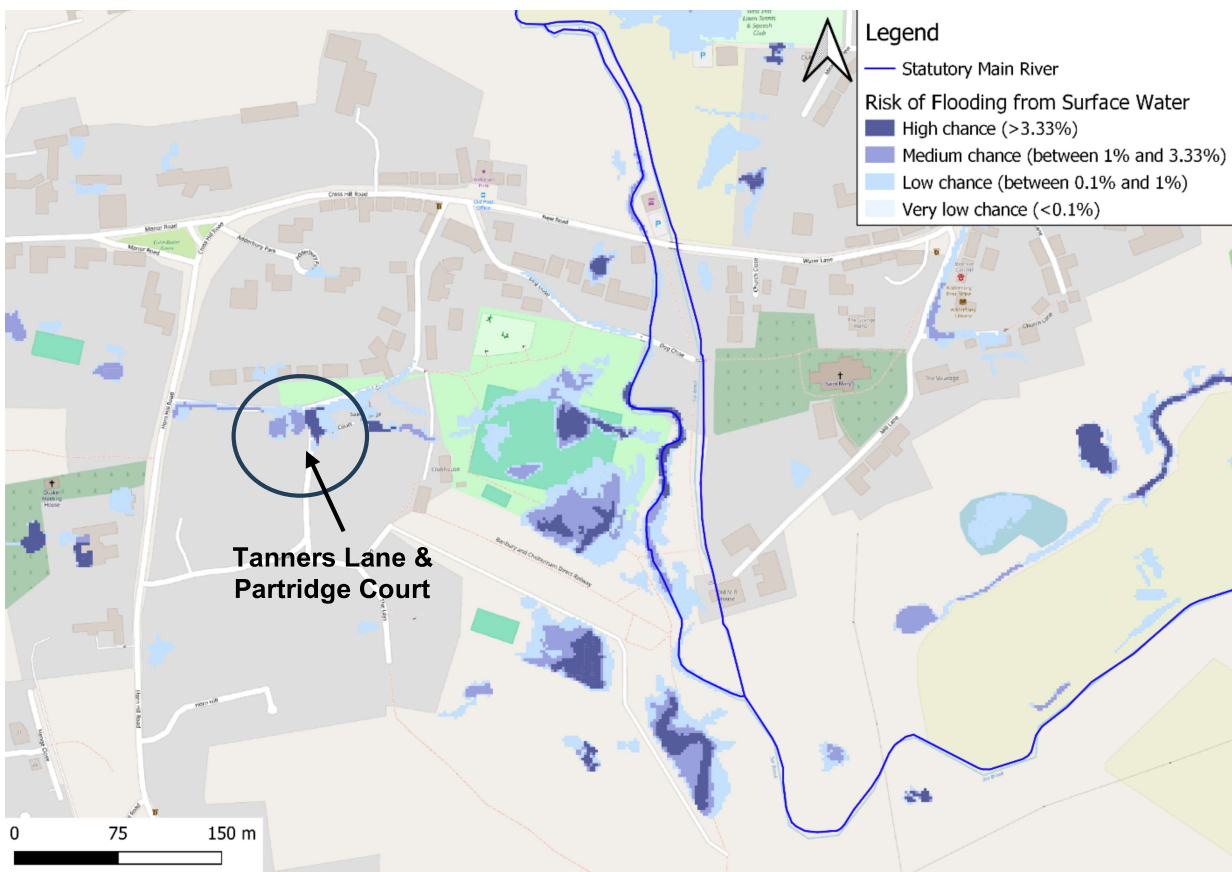


Figure 7 - Adderbury Risk of Flooding from Surface Water. Data from the DEFRA Data Services Platform (2025)

The proximity of the flooded properties on Dog Close to the Sor Brook is one of the leading causes of the flooding. The increased rates of flow through the brook following the rainfall events in September and November 2024 is likely responsible for the flooding experienced around Dog Close. (see Section 2.2).

The role of the Mill Stream in the flooding events is also an important consideration. Figure 8 shows the elevation of both channels taken from LiDAR data, which shows the Mill Stream to be perched approximately 1m above the natural elevation of the Sor Brook. The size of the Mill Stream is also much smaller compared to the Sor Brook. Despite this, it is understood from the Environment Agency that the majority of water flows through the Mill Stream meaning that once the capacity is exceeded, flooding is likely to occur through right bank overtopping, submerging the space between the Mill Stream and the Sor Brook as the flood waters seek the lowest part of the floodplain on the playfields.



Figure 8 - Elevation of the Sor Brook in comparison to the Mill Leat. (Source: DEFRA 2025)

Unlike the properties in Dog Close, the mechanisms of flooding for the properties in other areas of Adderbury including; Tanners Lane, Partridge Court and Round Close Road are likely to be as result of surface water flooding. Figure 9 shows the LiDAR generated elevation data, with maximum and minimum extents constrained to show the localised depressions around the flooded region on Partridge Court. Discounting building heights, the road and surrounding houses have two separate points with a 0.2m drop in elevation where surface water runoff may pool. These areas are therefore predicted by LiDAR to be at the highest risk of flooding from surface water. This is supported by the RoFSW outlines shown in Figure 7 and by the cross section of elevation in Figure 10.

Figure 9 also shows the locations of indicative overland flow pathways derived from LiDAR data in relation to Adderbury. Surface water flooding is difficult to forecast as exact rainfall location and volume are somewhat unpredictable and as such these maps should not be taken as an exact prediction. However, the LiDAR data shows flow pathways, represented by thin blue lines, to flow towards Sor Brook from west to east through the depressions identified.

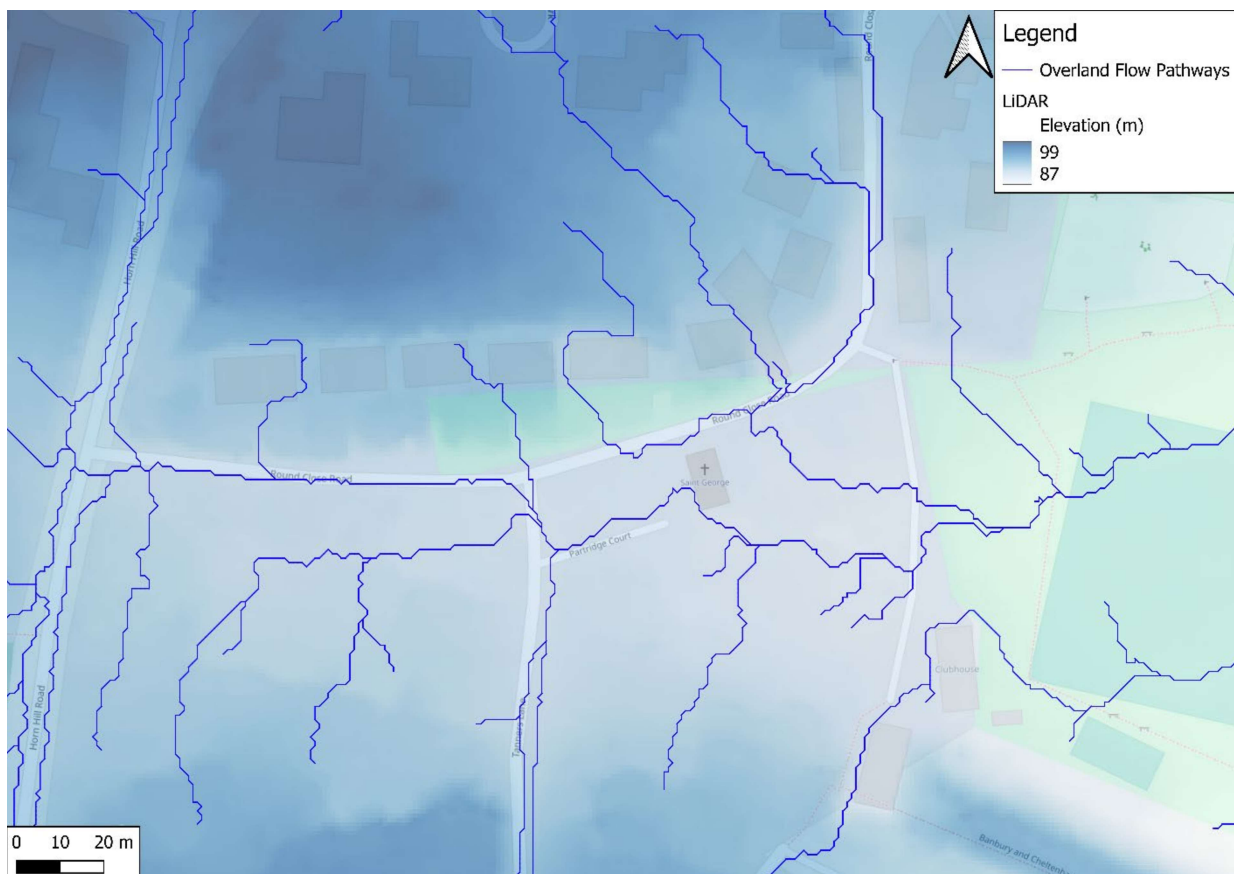


Figure 9 - Indicative overland flow pathways surrounding Partridge Court and Tanners Lane. (Source: DEFRA 2025)

A cross section taken through the region (Figure 10) shows the 0.2m depressions along Partridge Court when compared to the higher surrounding land. Surface water is more likely to pool in these regions, especially in cases where the amount of surface water runoff is substantial.

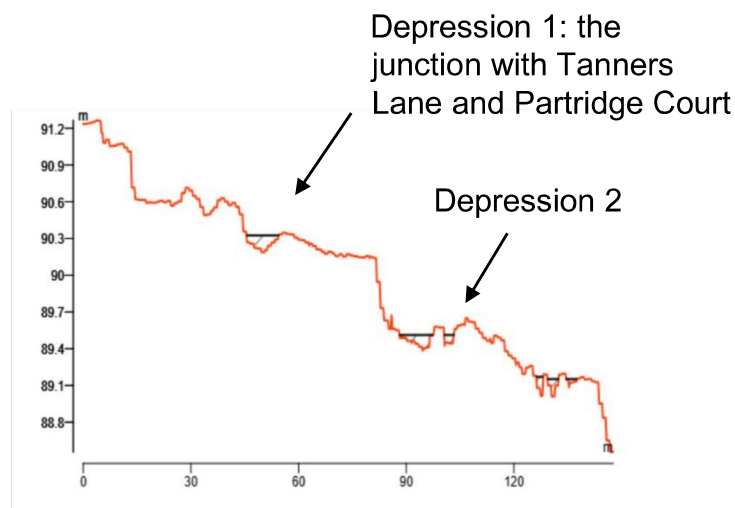
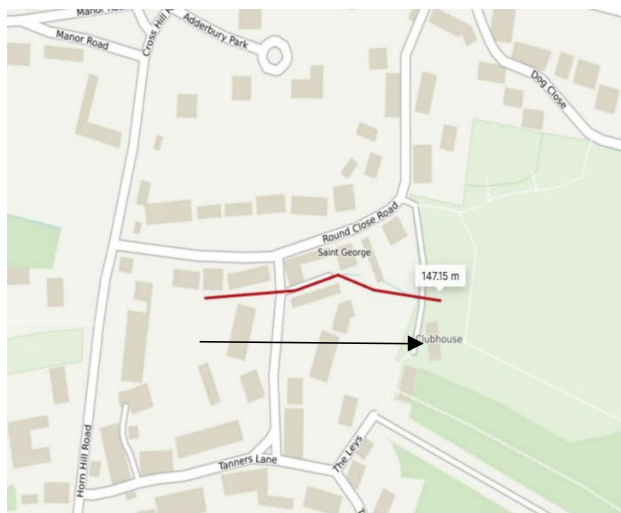


Figure 10 - Cross section of elevation across Partridge Court indicating localised depressions in land surface. (Source: DEFRA 2025)

### 1.3. Previous flood events

There is limited public data available of previous flood events in Adderbury. Anecdotally, there are reports from residents that flooding occurred in 2007 and 1997/8, with the outlines for the 1998 event mapped in DEFRA's Historic Flood Map (Figure 11). This is a GIS layer showing the maximum extent of individual Historic Flood Outlines from rivers, the sea and groundwater springs that meet a set criteria. It shows areas of land that have previously been subject to flooding in England. This excludes flooding from surface water, except in areas where it is impossible to determine whether the source is fluvial or surface water, but the dominant source is fluvial<sup>1</sup>. The map shows the eastern part of Dog Close to have experienced historical flooding.

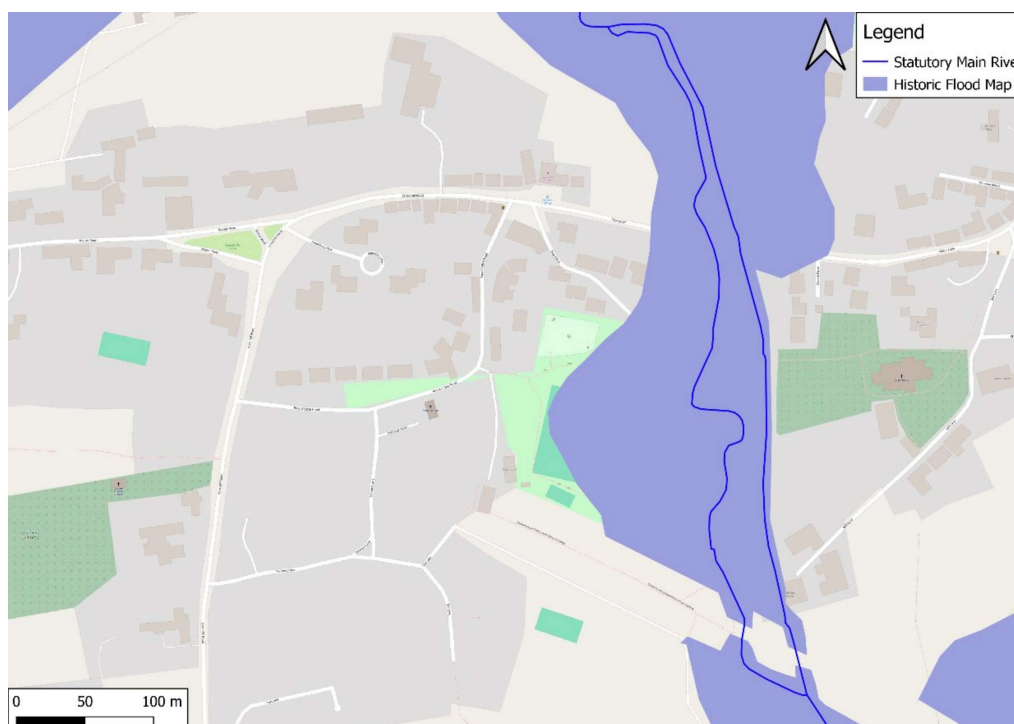


Figure 11 – Historic Flood Map of Adderbury (Source: DEFRA 2025)

<sup>1</sup> Historic Flood Map (DEFRA). Available at: <https://www.data.gov.uk/dataset/76292bec-7d8b-43e8-9c98-02734fd89c81/historic-flood-map1>



## **2. RECENT FLOOD ISSUES AND INVESTIGATION**

### **2.1. Summary of Flood Events**

Numerous flood reports were submitted by residents of affected properties in response to the September and November 2024 flooding. These flood reports, combined with information from the Parish Council indicate that up to 23 properties were flooded internally during the September and November 2024 events in Adderbury. These properties include:

- 9 properties in Dog Close
- 5 properties in Round Close Road
- 2 properties in Tanners Lane
- 2 properties in Partridge Court
- 2 properties in Horn Hill Road
- 3 properties in Manor Road

#### **September 2024**

The Met Office's report into the September 2024 flooding describes severe weather impacts across the UK<sup>2</sup>. Seven counties, including Oxfordshire, recorded more than 300% of their average September rainfall (Oxfordshire received 185mm), with September 2024 being the wettest calendar month in a series dating back to 1836 in Oxfordshire (and Bedfordshire). The largest proportion of this rain fell between the 21<sup>st</sup> and 30<sup>th</sup> of September, with rainfall between the 21<sup>st</sup> and 23<sup>rd</sup> of September attributed to the flooding detailed in this report.

The sheer amount of rainfall from the 21<sup>st</sup> to the 23<sup>rd</sup> of September led to increased surface water runoff across Adderbury, overwhelming the existing drainage systems, and consequently the conveyance capacity of the Sor Brook. This led to the overtopping of the Mill Stream and Sor Brook into the surrounding floodplain, which contains many of the properties around Dog Close.

Additionally, surface water runoff is reported to have occurred around properties in the other areas detailed above. The overland flow pathways and LiDAR shown in Figure 9 suggest that surface water runoff passes around and through the properties in the area. The elevation cross section in Figure 10 shows a succession of depressions and dips in the land surface that may allow surface water to collect and pool without flowing away.

#### **November 2024**

Storm Bert led to severe weather impacts across the entirety of the UK between the 22<sup>nd</sup> and 25<sup>th</sup> of November 2024<sup>3</sup>. Oxfordshire received a month's worth of rainfall in the period between the 22<sup>nd</sup> and 25<sup>th</sup> of November. The majority of the flood reports submitted to OCC by residents in Adderbury are dated in November as a response to

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<sup>2</sup> Record-breaking rainfall for some this September, Met Office. 1 Oct 2024. Accessed 15/04/25. Available at: <https://www.metoffice.gov.uk/about-us/news-and-media/media-centre/weather-and-climate-news/2024/record-breaking-rainfall-for-some-this-september>

<sup>3</sup> Storm Bert, 22 to 25 November 2024, Met Office, 28 Nov 2024. Accessed 17/04/25. Available at: [https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/weather/learn-about/uk-past-events/interesting/2024/2024\\_09\\_storm\\_bert.pdf](https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/weather/learn-about/uk-past-events/interesting/2024/2024_09_storm_bert.pdf)

the November flooding but make reference to flooding of the same nature also occurring in September.

Flooding, likely the result of surface water runoff, also occurred around the Round Close Road, Tanners Lane and Partridge Court area in November. Similarly to the September flooding, surface water is likely to have followed the flow pathways shown in Figure 9, entering properties in the area due to the water becoming trapped and not flowing in the direction predicted by LiDAR imagery.

As such, the effects of the substantial rainfall in November 2024 are assumed to be similar and to have had detrimental impacts on the region that are in line with the September 2024 events. The short period between the flooding events makes it unlikely that any significant mitigation action had time to be implemented or to take effect in the region

## 2.2. Rainfall analysis

Rainfall data has been obtained from the Department for Environment Food & Rural Affairs' (DEFRA) Hydrology Data Explorer<sup>4</sup>. A rain gauge and river level gauge for which data can be obtained are both located in the vicinity of Adderbury (Figure 12). The Grimsbury rain gauge in Banbury (roughly 6km to the north of Adderbury) is the closest and provides the most accurate representation of the rainfall in the region.

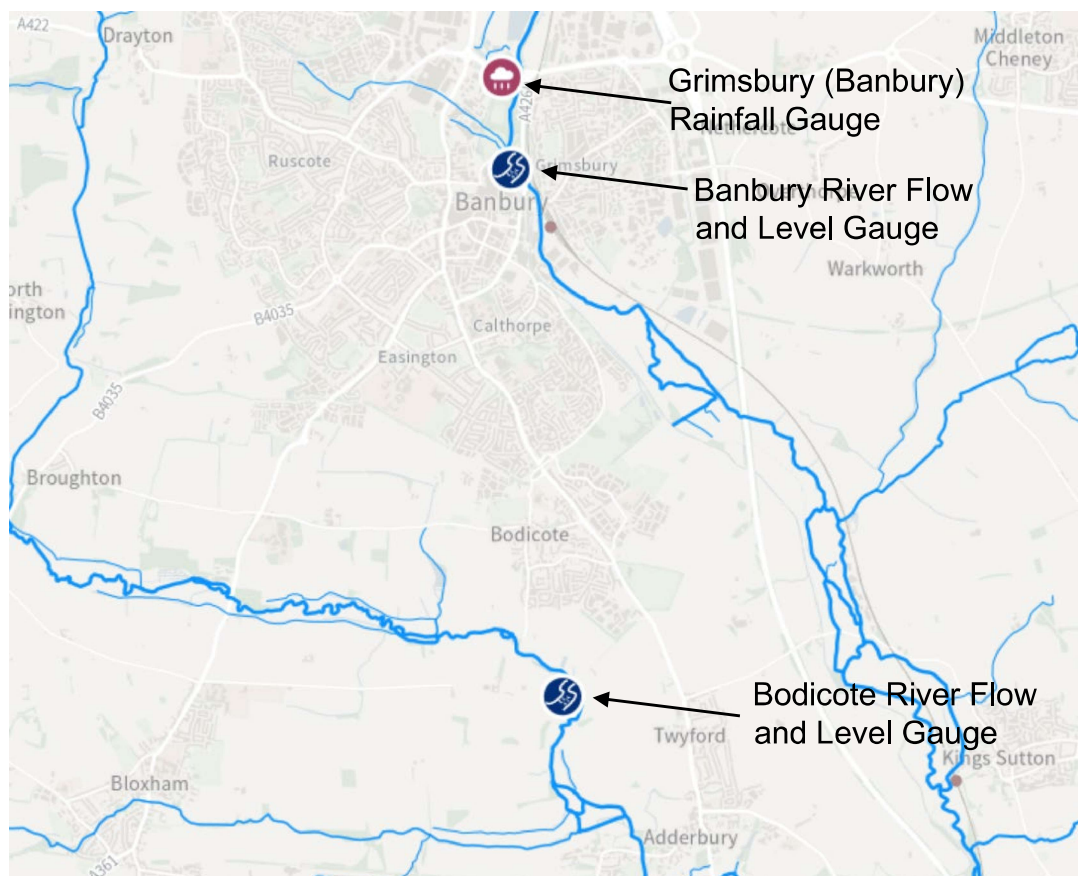


Figure 12 - Rainfall and river level gauges around Banbury and Adderbury. (Source: [DEFRA 2025](#)).

## September rainfall

<sup>4</sup> Hydrology Data Explorer, 2025. Department for Environment Food & Rural Affairs. <https://environment.data.gov.uk/hydrology/station/5466e4ec-fcb6-47f5-bb1f-fd1a54e108da> [Accessed 20/03/2025].

Three low pressure systems passed over the Oxfordshire region between the 21<sup>st</sup> and the 30<sup>th</sup> of September. Rainfall charts for this period, taken from the 2024 September rainfall report<sup>5</sup> are presented in Figure 13. The most extreme of the low pressure systems was the first between the 21<sup>st</sup> and 23<sup>rd</sup> of September, and the system that caused the flooding documented by this report.

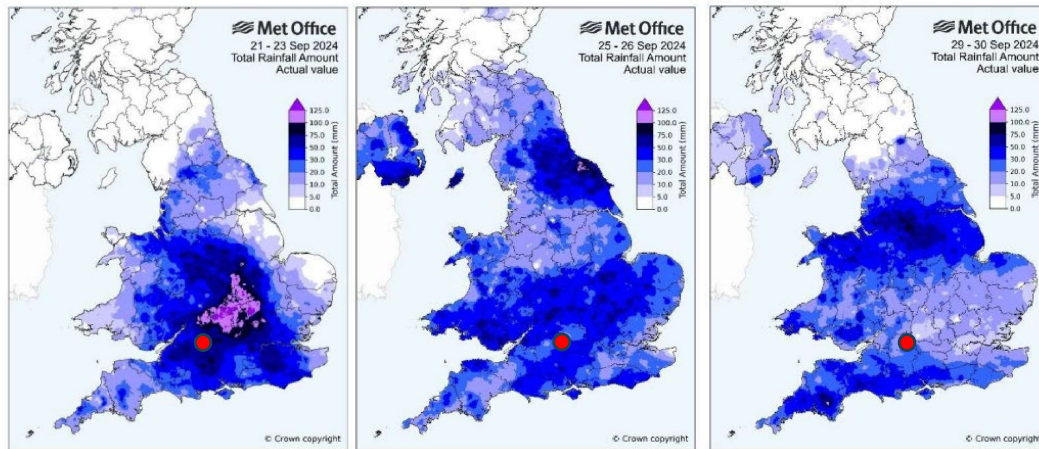


Figure 13 – Succession of rainfall in the last third of September 2024. The red dot indicates the location of Adderbury. (Source: Met Office, 2024).

At the Grimsbury (Banbury) rainfall gauge, 6mm, 50mm and 71mm of rain fell on the 21<sup>st</sup>, 22<sup>nd</sup> and 23<sup>rd</sup> of September, respectively (Figure 14). A separate rainfall event on the 26<sup>th</sup> of September followed a few days of little to no rain and will have likely contributed to the flooding period being prolonged. An incredibly high 15-minute maximum of 10mm fell at 16:30 on the 22<sup>nd</sup> of September with 8mm falling at 15:45 on the 26<sup>th</sup> of September. (Figure 15). At the time the daily rainfall total of 71mm on the 23<sup>rd</sup> of September was the third highest ever recorded at the Grimsbury (Banbury) rainfall gauge since records began in May 1989.

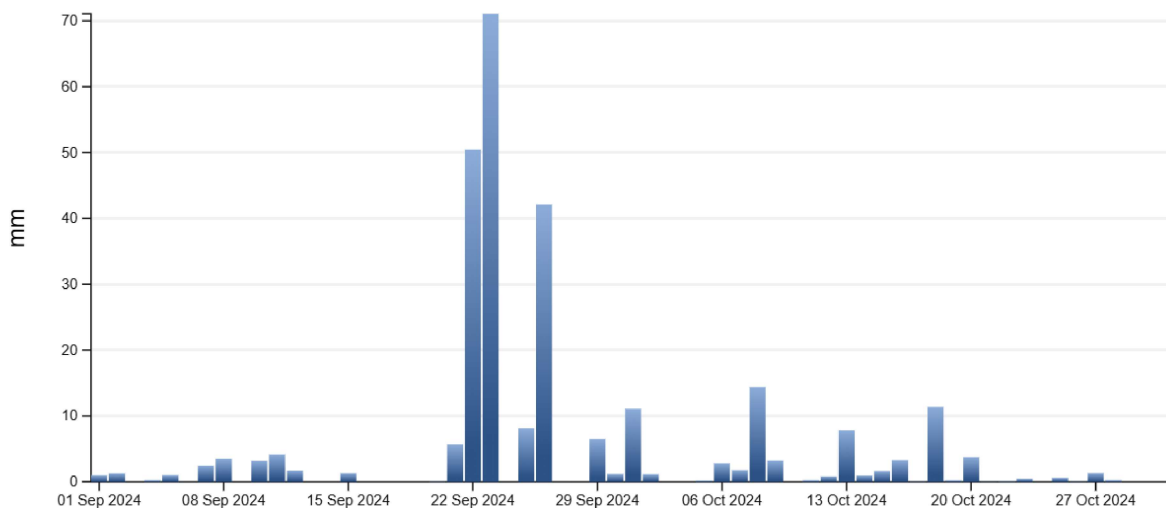


Figure 14 - Daily rainfall at the Grimsbury (Banbury) Gauge throughout September and October 2024. (Source: DEFRA 2025).

<sup>5</sup> Met Office, 2024. Exceptionally wet month for parts of the Midlands, September 2024. Accessed March 25. Available at: [https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/weather/learn-about/uk-past-events/interesting/2024/2024\\_07\\_september\\_rain.pdf](https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/weather/learn-about/uk-past-events/interesting/2024/2024_07_september_rain.pdf)

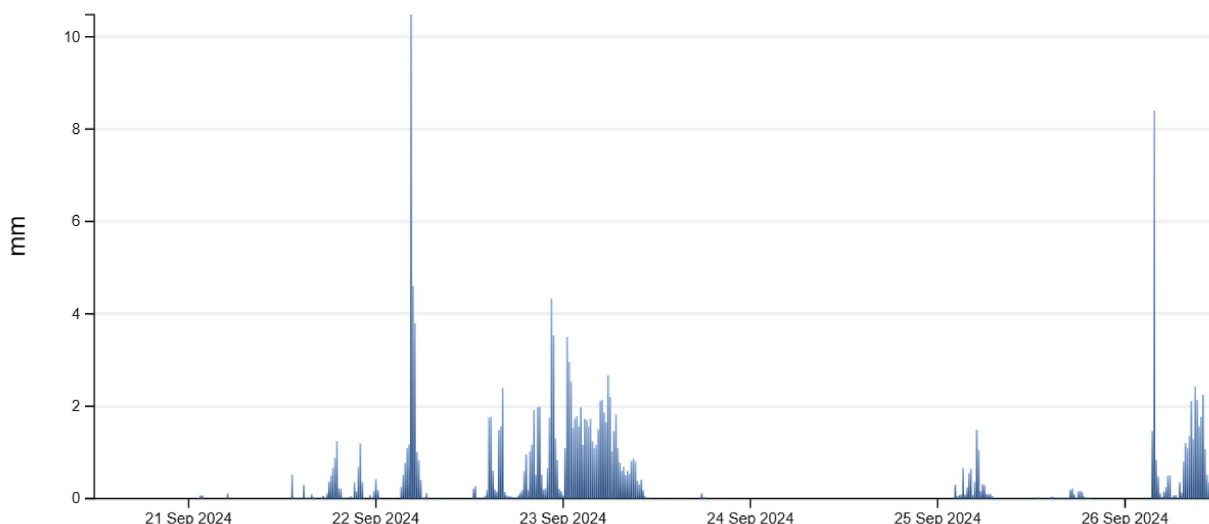


Figure 15 - Rainfall over 15-minute intervals at the Grimsbury (Banbury) Rainfall Gauge between 21-26<sup>th</sup> September 2024. (Source: [DEFRA 2025](#)).

## November rainfall

Across the three-day period of 22<sup>nd</sup> -24<sup>th</sup> November, the Met Office reported that Oxfordshire received their monthly rainfall average or more (Figure 16). Many parts of the county received particularly heavy rainfall on these dates, with the UK recording its wettest calendar day on 23<sup>rd</sup> November since 3<sup>rd</sup> October 2020 as an average across the whole country.

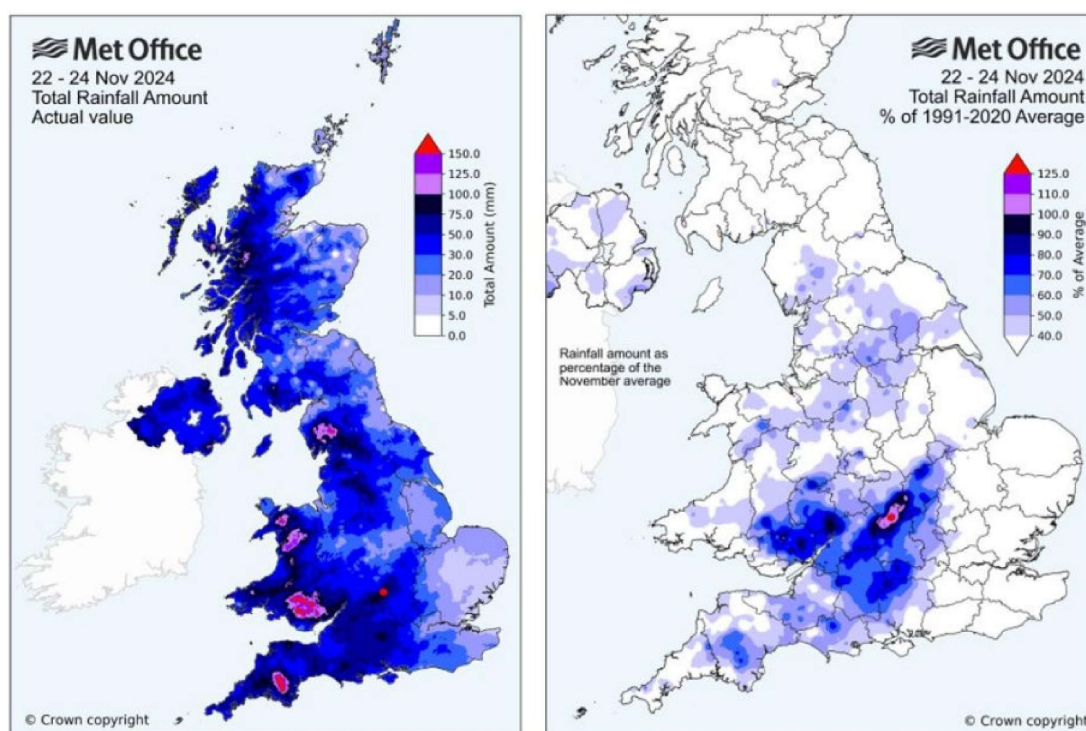


Figure 16 - Distribution of rainfall from 22<sup>nd</sup> - 24<sup>th</sup> Nov 2024. The red dot indicates the location of Adderbury. (Source: Met Office, 2024).

At the Grimsbury (Banbury) rainfall gauge 21mm and 48mm fell on the 23<sup>rd</sup> and 24<sup>th</sup> of November respectively. It should be noted that the data shown after the 25<sup>th</sup> November is anomalous and should be discounted. Indeed, the data presented on the DEFRA hydrology explorer website from this point until the 3<sup>rd</sup> December 2024 are all unconfirmed and appear to be anomalous and should not be considered as reliable



until checked by DEFRA. A 15 minute rainfall peak 5mm occurred twice on the 24<sup>th</sup> of September, the first being at 13:15 and the second being at 17:15.

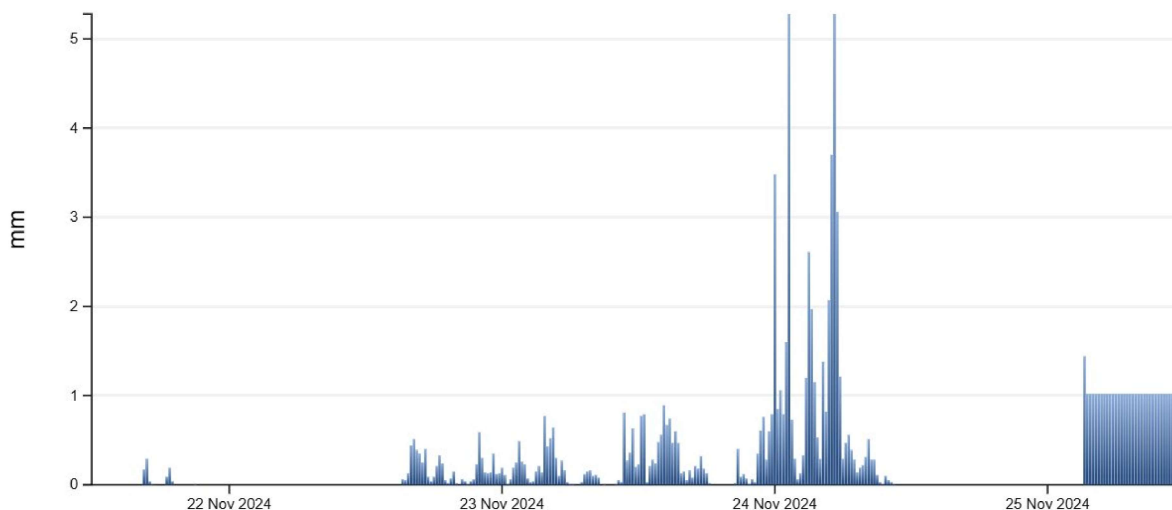


Figure 17 - Rainfall over 15-minute intervals at the Grimsbury (Banbury) Rainfall Gauge between 22-24<sup>th</sup> November 2024. Note that the data displayed after the 25<sup>th</sup> of November are anomalous and should be discounted. (Source: [DEFRA 2025](#)).

### 2.3. River data analysis

A more rapid response in river levels following rainfall is indicative of quick runoff rates and is often associated with impermeable surfaces like roads and car parks accelerating surface water flow towards the watercourse. However, the land use that surrounds the Sor Brook upstream of Adderbury as it flows around the edge of Banbury is predominantly classed as non-irrigated arable land by the Coordination of Information of the Environment (CORRINE) Land Cover (CLC) mapping service developed using Copernicus Satellites.

The river flow and level gauge on the Sor Brook at Bodicote is approximately 1km upstream of Adderbury and is best representation of flows in the Sor Brook (Figure 12).

#### September river flow data

The response in river flow following the rainfall events seen in late September 2024 is shown in Figure 18. Flow in the Sor Brook spiked dramatically, mirroring the rainfall in Figure 14 and Figure 15. This supports the contention that incredibly heavy rainfall in the region and towards Sor Brook was the overwhelming cause of the channel capacity being overwhelmed. The rainfall was also prolonged at an extent that didn't allow the river levels to recede.

River flow in the Sor Brook spiked from  $0.3\text{m}^3\text{s}^{-1}$  on the 21<sup>st</sup> of September, to a maximum flow of  $12.6\text{m}^3\text{s}^{-1}$  on the 24<sup>th</sup> of September (the daily average on 24<sup>th</sup> September was  $6.7\text{m}^3\text{s}^{-1}$ ). River flow then receded towards the end of the month, except for some less dramatic and brief rises in level following the rain associated with the remaining 2 low pressure systems in September.

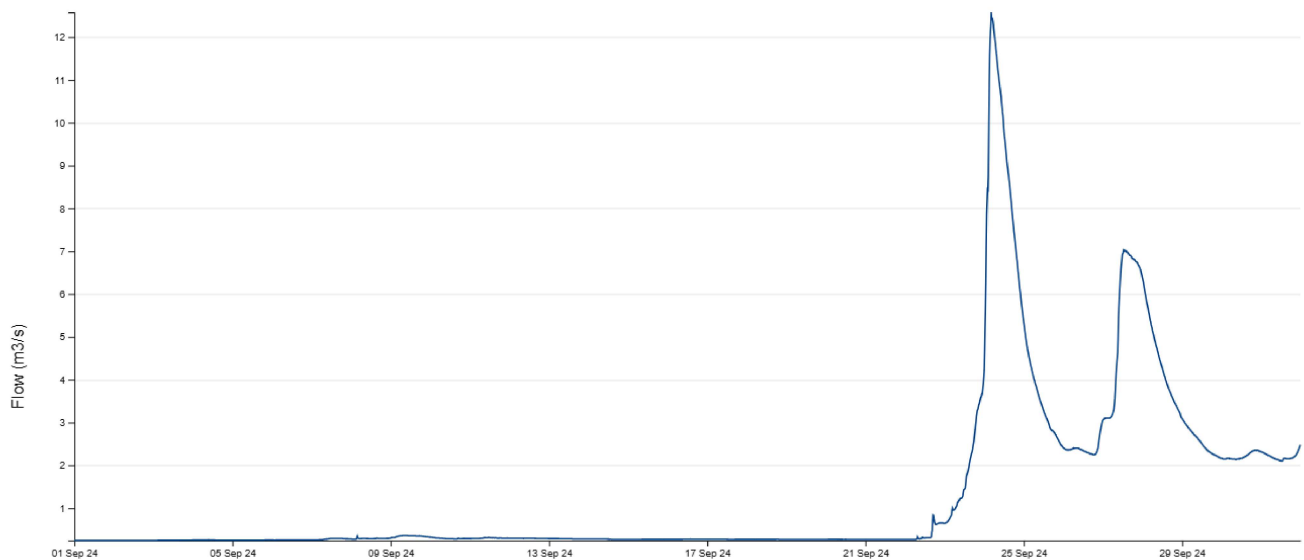


Figure 18 –Flow levels in Sor Brook at Bodicote prior to, during and following the flood event – maximum level peaking at  $12.58\text{m}^3\text{s}^{-1}$  on the 24<sup>th</sup> of September 2024. (Source: [DEFRA 2025](#)).

### November river flow data

The Bodicote flow gauge (Figure 19) spiked following the November rainfall event shown in Figure 19. Despite the amount of rainfall that fell during the November 2024 event being lower than during the September 2024 event, the peak flow of  $16.46\text{m}^3\text{m}^{-1}$  was greater. The flow also peaked in a single event without prolonged rainfall. As such, the flooding experienced in November is likely to have come as a result of a combination of intense rainfall combined with an already saturated catchment from the September rainfall. This differs from the multi peaked event in September, caused by a series of low pressure systems that led to the catchment remaining ‘topped up’ over the course of multiple days.

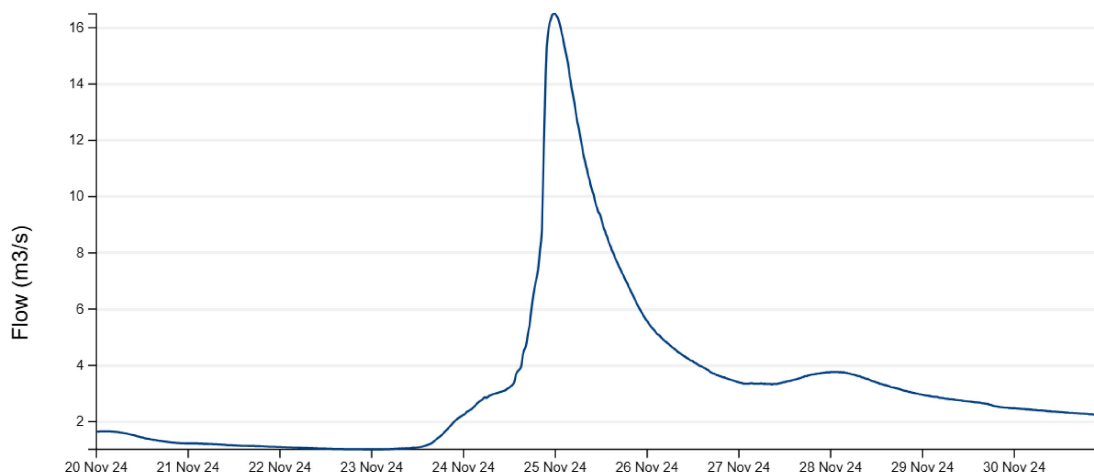


Figure 19 - Flow levels in Sor Brook at Bodicote prior to, during and following the flood event – maximum level peaking at  $16.5\text{m}^3\text{s}^{-1}$  on the 24<sup>th</sup> of November 2024 at 23:30. (Source: [DEFRA 2025](#)).

The data presented here supports the conclusion that county-wide intense rainfall in two separate periods was the primary cause of flooding in Adderbury. The first period between the 21<sup>st</sup> and 23<sup>rd</sup> of September and the second period between the 22<sup>nd</sup> and 24<sup>th</sup> of November.

## 2.4. Flood Incident Reports

Following the September and November 2024 flood events, the Parish Council prepared two Flood Incident Reports, which includes details of flooding mechanisms observed and likely causes.

1. Flooding in Adderbury 2024<sup>6</sup> - Report re Dog Close from Adderbury PC Dec 2024 (This report focuses on the fluvial flooding experienced in Adderbury)
2. Flooding in Adderbury 2024<sup>7</sup> - Report from Adderbury from Parish Council, Dec 2024. (This report focuses on the surface water flooding experienced in Adderbury)

The details of these reports and information from OCC Highways are summarised below:

### 1. Dog Close

The Flood Incident Report confirmed that 9 properties experienced flooding in Dog Close during the September / November flood events. These properties were confirmed to have flooded due to flows exceeding the capacity of the Sor Brook and Mill Stream. The report identifies several possible issues that contributed to the flooding experienced including:

- Pinch points in the Sor Brook channel around meanders when flows are impeded.
- Lower banks which have been eroded by flood water on the right hand bank of the Mill Stream between Water Lane and Church Bridge.
- The capacity of the side sluice at the Old Mill House.
- The ridge of higher ground immediately south of Dog Close that prevents flood water draining into the floodplain at the Lucy Plackett playing fields.
- The route of the surface water pipe that crosses the Lucy Plackett playing field, with the discharge point being located at the point where properties are most at risk of flooding.

The report identifies several possible actions, some of which have been picked up as recommendations in this report.

### 2. Surface water flooding

#### At Round Close Road, Tanners Lane and Partridge Court

Round Close Road is the lowest point in this area of village. All surface water from the area to the south (Milton Road), the area to the north (Cross Hill Road/ Water Lane areas) and the area to the west (Hornhill Road/ Manor Road areas) is directed towards Round Close Road where it enters a pipe on the south side of Round Close Road. It is estimated by the Parish Council that this single pipe is draining approximately 200 acres of farmland and village properties.

It is understood from OCC Highways that the pipe that crosses the road is a 300mm diameter pipe, which then reduces to a 225mm diameter pipe at the western end of Round Close Road. This pipe then makes several right angled turns at the junction of Tanners Lane before entering the car park area of Partridge Court. The section of pipe that goes through Partridge Court is not OCC Highways maintained and is the

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<sup>6</sup> Flooding in Adderbury 2024 - Report re Dog Close from Adderbury PC, Dec 2024

<sup>7</sup> Flooding in Adderbury 2024 - Report from Adderbury from Parish Council, Dec 2024.

responsibility of the landowner. The pipe then discharges into an open ditch in the gardens of properties at the lower end of Round Close Road before again being piped under the Lucy Plackett playing field and into the Sor Brook. It is understood that during the September and November rainfall events, these drainage assets were under considerable pressure with some unable to convey the volumes of surface water draining to this area.

Road gullies were inspected by the Parish Council and residents on Monday 2nd December 2024. The gullies were found to be surcharging with water coming out and travelling down the slope of the road to Tanners Lane. The report suggests that the gullies had not been regularly cleared and were last maintained some time ago. The blockage of the gullies means that surface water travels down the road. It is likely that the blockage of these gullies contributed to the flooding experienced during the September and November 2024 rainfall events.

The main pipe in the area was also inspected. The manholes at both ends of the pipe appeared too small for the amount of water expected to flow through it. The pipe was also still at capacity despite there being no rain for multiple days. The right angle turns in the pipe appear to exacerbate the issue and further hold flow back onto the road surfaces.

Surface water was also found to be collecting in the car park area of Partridge Court. Following the September floods, the report states that the fire service removed the lower boarding of a fence which released water through to the gardens further along Round Close Road.

The Parish Council report also highlights springs that appear to be emerging along the north side of Round Close Road. These appeared to be piped underneath the road towards the gullies on the south side.

### **Horn Hill Road and Manor Road**

Road gullies were inspected on Horn Hill Road on Monday 2nd December 2024. They were found to have not been cleared for some time leading to excessive rainwater being forced onto the road surface and flowing downhill towards Round Close Road and contributing to the flooding there.

The Parish Council Report highlights that water has been observed coming through a wall adjacent to Horn Hill Road, opposite the entrance to Round Close Road. This appears to be coming from ditch/drainage system to the north of the disused railway embankment which runs along the lowest point of gardens in Manor Road (south side). The water collects on the footpath and then travels down Round Close Road. There is no further information available on the possible flooding mechanisms for the properties in Manor Road.

## **2.5. Site Visit and Observations**

A site visit was conducted on the 21<sup>st</sup> of January 2025 with representatives from OCC, during which the team visited multiple locations surrounding Dog Close and along the Sor Brook and Mill Stream, taking photos and discussing the areas that were understood to have experienced the most flooding. The observations and discussions on site informed the finding and recommendations detailed in this report. It is worth noting the Environment Agency also conducted a site visit with the Parish Council on

the 9<sup>th</sup> of January 2025, however the following sections cover the observations from January 21<sup>st</sup> 2025.

The site team did not visit the region to the west that experienced flooding as a result of surface water runoff. Instead, a desk based analysis has been undertaken, supplemented by the findings from the Parish Council and residents.

The areas that the site team noted required the most attention were: the weir just upstream of the village; a Thames Water pipe across the downstream side of Dog Close bridge that is trapping a significant amount of gravel; a trench recently dug out on Dog Close by CDC that had the intention of releasing water back into the channel; potential damage to channel walls in the area; the layout and condition of the Mill Stream at its downstream end close to the Old Mill House.

The site team were unable to gain access to the upstream weir due to its location on private property. A call with a member of the local Asset Performance team at the EA confirmed that the structure is a simple fixed crest weir.

A Thames Water pipe on the downstream side of Dog Close bridge was inspected by the site team. The pipe, which is shown in Figure 20, is set quite low into the channel. The size of the pipe is quite small however and would be unlikely to have a major impact on channel capacity. The pipe poses more of an issue in its potential to trap debris and cause blockage in the channel from materials such as gravel, branches, wood or other debris like fences etc that are collected by the river during high flow events. It is essential that the channel around this pipe is maintained and kept free of debris.



*Figure 20 – Thames Water pipe along Sor Brook on downstream side of the Dog Close bridge. (Source: Site visit Jan 2025)*



On the day of the site visit, OCC had constructed a slipway to try to relieve pooling water from Dog Close to drain back into the Sor Brook (Figure 21). An additional channel started at the raised elevation south of Dog Close will provide extra capacity in the region but will also facilitate the drainage of Dog Close such that water has less time to collect and pool. The additional channel may also encourage the flood water to flow towards the floodplain centred around the playing fields rather than the properties upstream.

During the site walkover, the team assessed whether any low points or damaged areas along the Mill Stream bank could have led to the channel overtopping at a level that is lower than the anticipated capacity of the channel. The main area of concern was downstream of Dog Close in the region between the Dog Close bridge and the Old Mill. Although there were some observations of damaged walls, the banks of the Sor Brook and the Mill Stream were generally found to be in a reasonable condition and should not have led to a capacity that is less than expected. It should be noted that the management and maintenance of the riparian zone falls under the jurisdiction of the landowner (See Section 4.7). It was noted that the right bank of the Mill Stream was slightly lower than the left bank just downstream of New Road. Raising of the bank in this area may benefit the properties in Dog Close.



*Figure 21 - Slipway being cut along field adjacent to Dog Close to allow water to drain back into the channel more quickly. (Source: Site visit Jan 2025)*

The site team also inspected the mill channel (Figure 22) which goes under the Old Mill House. This original route for the Mill Stream is now blocked off. Water is now funnelled down a small side sluice causing a significant flow restriction. During the flood events water was observed to back up from here which may have contributed to the retention of water in the flooded regions during the events detailed by this report.



*Figure 22 – Disused Mill channel and side sluice diverting flow back into the Sor Brook. (Source: Site visit Jan 2025)*

The site visit also confirmed observations from the desk-based study that the Sor Brook is set at a lower elevation than the Mill Stream and the playing fields are likely to have been the original floodplain of the Sor Brook. This suggests there would be a potential benefit to amendments to the channels in two areas:

- A second relief channel cut from the Mill Stream back into the Sor Brook.
- A relief channel to ‘cut the corner’ of the meander just downstream of Dog Close.

During high flows, the side channel from the Mill Stream does not have enough capacity to convey water causing water levels to back up and flooding to occur. An additional sluiced channel that removes water back into the Sor Brook could potentially alleviate some flooding. Cutting the corner of the meander on the Sor Brook also has the potential to decrease the amount of time that water takes to pass through Adderbury meaning that pooling of flood water is less likely. These changes have potential to increase flooding in other areas and would need to be investigated fully before being implemented.

### **3. CONCLUSIONS**

This investigation has reviewed the events and conditions that occurred primarily between the 21<sup>st</sup> and 23<sup>rd</sup> of September 2024 and between the 22<sup>nd</sup> and 24<sup>th</sup> of November 2024 which led to flooding in Adderbury around the Sor Brook.

Most of the properties that experienced flooding in the region are located within land classified as having a high probability of fluvial flooding according to the EA’s RoFRS. The extremely high rainfall that was seen in both events was some of the highest ever recorded in the region.

The low point in the floodplain in which the properties are located meant that the properties have little to no additional protection from flooding once the banks of the Mill Stream and Sor Brook are overtopped during extreme events. Allowing flood waters to spill more efficiently into the playing fields floodplain may alleviate some of this pressure.

Anecdotal evidence suggests that surface water flow paths and restrictions to existing drainage assets may have also contributed to the flooding experienced in Adderbury. Reports suggest that gullies were blocked and overwhelmed, and drainage assets have insufficient capacity to manage the surface water flows experienced.

Nonetheless, in both events, flooding in Adderbury primarily occurred due to heavy rainfall over a short period, leading to increased river levels and surface water runoff. The sheer volume of water caused the channel to reach its capacity and overflow, whilst also preventing additional surface water from entering the channel and being drained away. This created issues at key locations where surface water and fluvial waters interact throughout Adderbury, especially surrounding drainage points between the Mill Stream and the Sor Brook. The high fluvial flows placed stress on key structures, like the decommissioned sluice at the downstream end of the Mill Stream causing the channel to overflow. Surface water that was unable to effectively drain away also caused flooding to areas of Adderbury around Tanners Lane, Partridge Court and Round Close Road.

Given that one of the primary sources of flooding is fluvial, it is recommended that options for upstream flow attenuation and storage are explored. The river and catchment upstream of Adderbury offer opportunities for Natural Flood Management (NFM) and there are sections where the natural valley could be used for online storage. By slowing key inflows, whether from upstream, throughout the town, or from key surface water routes, waters would enter the river slower, reducing the overall strain on channel capacity and allowing flood waters to drain more effectively through the town.

Additionally, continuing to ensure that drainage systems function freely will minimise the stress on channel capacity and drainage assets. Maintaining the channels and ensuring that the Mill Stream and sluices are functioning properly would help to minimise the risk of flooding.

Due to the unpredictable nature of rainfall, it may not be possible to fully eliminate the risk of flooding to these properties. Recommendations have therefore been suggested that could reduce the likelihood and detrimental impact of flooding through resilience planning.

Establishing a flood action group to deploy emergency resilience support would be beneficial. It is also recommended to explore the feasibility of property flood resilience measures. Section 5 details the recommendations resulting from this investigation.

## **4. RIGHTS AND RESPONSIBILITIES**

### **4.1. Communities and Residents**

Communities may consist of the Town or Parish Council, Flood Forum, Community Group and affected residents, amongst others.

Communities and residents who are aware that they are at risk of flooding should take action to ensure that they and their properties are protected.



Community resilience is important in providing information and support to each other if flooding is anticipated. Actions taken can include [subscribing to MET Office email alerts](#) for weather warnings, nominating a Community Flood Warden, producing a community flood plan, implementing property level protection and moving valuable items to higher ground. Finally, individual households can create their own personal flood plans, such as collating important documents for quick removal from the property, torches, waterproof clothing etc. A flood warning service is also available across Adderbury and residents can [sign up to receive these flood warnings](#).

OCC has produced a number of flood guides covering various subjects, some of which relate to this type of flood incident. The relevant guides have been identified and are available at: [www.oxfordshirefloodtoolkit.com](http://www.oxfordshirefloodtoolkit.com)

#### **4.2. Lead Local Flood Authority (LLFA)**

As stated within the introduction section, OCC as the LLFA has a responsibility to investigate flood incidents under Section 19 of the F&WMA.

The LLFA also has a responsibility to maintain a register of assets which have a significant effect on flooding from surface runoff, groundwater or ordinary watercourses (non-Main River) as detailed within Section 21 of the F&WMA. The register must contain a record about each structure or feature, including the ownership and state of repair. OCC is also required to keep a record of flooding hotspots across the county.

OCC's practices relating to third party assets is to notify third party owners of their asset forming part of a flood risk system and assist by advising those third party owners on the condition of their assets and their maintenance responsibilities.

As LLFA, OCC will be looking for support from other risk management authorities, communities and individual homeowners to ensure flood incidents are reported, and any assets which have a significant effect on flood risk are recorded on the asset register.

While OCC can suggest possible causes of flooding and make recommendations to ensure flood risk is mitigated as far as possible, the F&WMA does not provide OCC with the mandate or funding to act on identified causes of flooding or force risk management authorities to undertake any recommended actions.

#### **4.3. Highway Authority (Oxfordshire Highways)**

Oxfordshire Highways have a duty to maintain the highway under Section 41 of the Highway Act 1980 but subject to the special defence in Section 58.

New highway drainage systems are designed to Highways England's Design Manual for Roads and Bridges (Volume 4, Section 2). They are only required to be constructed to drain surface water runoff from within the highway catchment rather than from the wider catchment.

There are historic drainage systems in historic highways which can become the responsibility of the Highway Authority due to dedication, as opposed to adoption. These drainage systems may not have been designed to any standard.

Oxfordshire Highways undertake regular highway drainage cleansing. Identify and develop a detailed plan of their assets.

If flooding occurs OCC will assess the capacity of the highway assets and identify any areas with insufficient capacity for draining runoff from the highway. Where this leads to flood risk to properties improvement works should be considered.

Oxfordshire highways should assess the suitability of third party drainage systems accepting discharge from Highway Drainage systems and report any unsatisfactory areas to the relevant Risk Management Authorities.

#### **4.4. Water Authority - Thames Water Utilities (TW)**

Water and sewerage companies are responsible for managing the risks of flooding from surface water, foul water or combined sewer systems. Public sewers are designed to protect properties from the risk of flooding in normal wet weather conditions. However, in extreme weather conditions there is a risk that sewer systems can become overwhelmed and result in sewer flooding.

Sewerage undertakers have a duty, under Section 94 of the Water Industry Act 1991, to provide sewers for the drainage of buildings and associated paved areas within property boundaries. Since the 1<sup>st</sup> October 2011 the majority of private sewers and lateral drains in England and Wales were transferred into public ownership, meaning they are now the responsibility of the relevant sewerage undertaker.

A public sewer is a conduit, normally a pipe that is vested in a Water and Sewerage Company or predecessor, that drains two or more properties and conveys foul, surface water or combined sewage from one point to another, and discharges via a positive outfall.

There is no automatic right of connection for other sources of drainage to the public sewer network. Connection is therefore discretionary following an application to connect.

#### **4.5. Cherwell District Council (CDC)**

District Councils have powers under Section 14 of the Land Drainage Act 1991 (LDA) to undertake flood risk management works on ordinary watercourses (non-Main River) where deemed necessary.

Under Section 20 of the LDA, District Councils have the powers to (by agreement of any person and at that person's expense) carry out any drainage work which that person is entitled to carry out. Agreement may not be required in certain emergency or legally upheld situations.

Cherwell District Council also has delegated authority from OCC/LLFA to serve notice on persons requiring them to carry out necessary works to maintain the flow of ordinary watercourses under Section 25 of the LDA and receives funding from the LLFA to do this.

The District Council is the Planning Authority and has a role in Building Control and the Building Regulations.

#### **4.6. Environment Agency (EA)**

The EA is responsible for taking a strategic overview of the management of all sources of flooding and coastal erosion. This includes setting the direction for managing the risks through national and strategic plans; providing evidence and advice to inform Government policy and support others; working collaboratively to support the development of risk management skills and capacity; and providing a framework to support local delivery.

The EA also has operational responsibility for managing the risk of flooding from main rivers. Main rivers are usually larger river and streams and include all watercourses defined on the main river map which can be accessed at

<https://environment.data.gov.uk/DefraDataDownload/?mapService=EA/StatutoryMainRiverMap&Mode=spatial>

The responsibility for maintenance and repair of rivers lies with the riparian owner, but the EA have permissive powers to carry out maintenance work on main rivers under Section 165 of the Water Resources Act 1991 (WRA).

The EA encourage third party asset owners to maintain their property in appropriate condition and may take enforcement action on a prioritised basis where it is appropriate. They may also consider undertaking maintenance or repair of third party assets only where it can be justified in order to safeguard the public interest and where other options are not appropriate.

Further remit of the EA includes;

- Preparing preliminary flood risk assessments and flood risk management plans for flooding from main rivers, reservoirs and the sea (F&WMA 2010)
- Warning and informing (Ministerial Direction to the National Rivers Authority, 1996)
- Regulating activities that may affect the risk of flooding from main rivers (Environmental Permitting Regulations (England and Wales) Regulations 2016)
- Carrying out surveys and mapping (F&WMA 2010, Water Resources Act 1991)
- Reporting to the minister on flood and coastal erosion risk and how the national and local strategies are being applied by all of the authorities involved (FWMA, 2010)
- Acting as a statutory consultee for planning authorities providing advice on planning applications, local plans and environmental assessments regarding flood risk from main rivers and the sea (Town and Country Planning (Development Management Procedure) (England) Order 2015)

#### **4.7. Landowners and Developers**

Landowners are responsible for the drainage of their land and controlling any movement of sediment from their land. Legally, owners of lower-level ground have to accept natural land drainage from adjacent land at a higher level. The exception to this is where the owner of the higher level land has carried out “improvements” such that the runoff from the land cannot be considered “natural”.

Agricultural practices by landowners can be considered as “improvements” to the land, so that cultivation of crops or other land uses can take place. Mitigation works are required on improved land to account for the change in natural land drainage and changes to surface water runoff this can create.

Landowners and developers are responsible for working with the Local Planning Authority to ensure that their development is completed in accordance with the planning permission and all conditions that have been imposed.

Advice for developers is available on the Oxfordshire Flood Toolkit.

[www.oxfordshirefloodtoolkit.com/planning/developers/](http://www.oxfordshirefloodtoolkit.com/planning/developers/)

## **5. RECOMMENDATIONS**

### **5.1. General**

Listed below are the recommendations arising from this formal Section 19 Flood Investigation Report. All the actions are initial recommendations that require discussion with relevant stakeholders to determine their feasibility.

It is important to note that it is for the relevant responsible body or persons to assess each recommendation in terms of the legal obligation, funding, resource implications, priority and cost/benefit analysis of undertaking such action.

The recommendations may be included within the action plan linked to the Local Flood Risk Management Strategy or in the relevant risk management authority’s future work programmes, as appropriate.

Authorities should work together Look into funding opportunities to carry out the listed actions. There are multiple funding sources which could contribute to schemes and improvement works going forward. The majority schemes will require elements of partnership working and contributions to be successfully funded. They are likely to need to provide multiple benefits such as improving flood resilience whilst also managing water levels, reducing drought risks, helping nature recovery as well as climate adaptation.

There are several funding options available which can be explored through multi agency working groups such as,

- Flood & Coastal Erosion Risk Management (FCERM)
  - Flood Defence Grant in Aid (FDGiA)
  - Local Levy Regional Flood and Coastal Committee (RFCC)
- DEFRA Natural Flood Management Funding
- Woodland Creation Grants
- Agricultural & Environmental Schemes (Countryside Stewardship)
- Funding sources relating to development and regeneration, such as section 106 agreements, Community Infrastructure Levy (CIL) and New homes bonus
- Non-government organisations and charitable trusts
- Community fundraising and events
- Lotteries (Heritage Lottery Fund, Big Lottery, Arts Council
- Volunteering
- Nature for Climate Fund
- Grants from other government departments, such as BEIS, MHCLG, DfT, DfE (for example, Flood Resilient Schools)
- UKRI – the research councils funding

- Business in the community
- Green recovery challenge fund
- Partnership funding (for example, contributions from partners, local authorities, businesses and communities etc.

## 5.2. Main Recommendations

Recommendation	Lead Stakeholders	Consulting stakeholders
Residents and the Parish Council to set up a flood action group. Through this action group, discuss the issues and recommendations from this S19 report. With support from CDC & OCC develop emergency resilience plans.	Residents, Parish Council	OCC LLFA, CDC,
Residents to sign up for Flood Alerts and Warnings and develop a personal flood plan.  Guidance on this can be found at: <a href="#">Oxfordshire County Council – Flood Toolkit</a>	Residents	Parish Council, CDC, OCC LLFA
Parish Council / landowners to review the feasibility of constructing two new sections of channel to alleviate flood water pressure away from key stress areas. The first being a relief channel to ‘cut’ the meander downstream of Dog Close bridge; the second to remove flow from the Mill Stream upstream of the Mill House towards the Sor Brook and the playing fields floodplain.	Parish Council/ Landowners	EA, OCC LLFA, CDC
Owner of the Old Mill House to discuss with the Environment Agency the feasibility of works to improve capacity through the side sluice.	Landowner, EA	OCC LLFA, CDC
Parish Council and residents to continue with the construction of the relief trench currently being dug to release flow away from Dog Close and back into the Sor Brook.	Parish Council, Residents	OCC LLFA, EA
Landowner to discuss with the Environment Agency the feasibility of raising the RHB of the Mill Stream between Water Lane and Church Bridge, ensuring that flood risk isn’t transferred elsewhere.	Landowner, EA	OCC LLFA, CDC
Environment Agency to consider using their permissive powers under the Land Drainage Act 1991 to ensure riparian owners along the Main River carry out required channel maintenance.	EA	Landowners CDC
OCC LLFA and Environment Agency to work with landowners to discuss willingness for natural flood management (NFM) measures to be implemented	OCC LLFA, EA	Landowners, Parish Council, CDC

on rural land upstream of Adderbury to slow and / or attenuate flows.		
Environment Agency to explore the feasibility of implementing upstream flood alleviation measures to attenuate peak flows reaching the Sor Brook at Adderbury.	EA	OCC LLFA, CDC, Landowners Parish Council
OCC Highways to review the current maintenance programme for their drainage assets in Adderbury, and look to increase the frequency of cleaning, in line with current Countywide Highway Maintenance Programme and funding availability.	OCC Highways	
<p>OCC Highways, CDC and Partridge Court landowner to explore possible causes of limited network capacity, which may have contributed to the internal property flooding in:</p> <ul style="list-style-type: none"> <li>• Round Close Road</li> <li>• Tanners Close</li> <li>• Partridge Court</li> </ul> <p>Investigations to include a camera surveys of highway gullies and the main pipe from Round Close Road through to the playing fields. Investigations to identify recommendations for potential network improvements.</p>	OCC Highways, CDC, Partridge Court landowner	OCC LLFA Parish Council
Thames Water to consider the viability of options for adjusting the position of their pipe on the downstream side of Dog Close Bridge to reduce the risk of debris blocking the bridge and channel.	Thames Water	CDC, OCC LLFA
Thames Water to conduct ongoing and regular maintenance of Thames Water assets. This could involve regular checks for blockages in the system, considering repairs to any damaged structures to reduce the risk of surcharge and identifying area parts of their network that may be undercapacity.	Thames Water	
CDC and the Partridge Court landowner to explore the feasibility of formalising a flow route from Partridge Court car park to the open ditch behind the properties in Round Close Road, to alleviate the ponding of water in Partridge Court car park.	CDC Partridge Court landowner	OCC LLFA Parish Council
OCC LLFA to explore the spring flows emerging from the north side of Round Close Road and possible ways to formalise the routing of these flows into the drainage network.	OCC LLFA	OCC Highways, CDC
Explore the willingness to implement property flood resilience measures (PFR).	Property owners	OCC LLFA, CDC, Parish Council

<p>Guidance on PFR measures can be viewed through Ciria document (C790F) and a link to this document is provided below:</p> <p><a href="https://www.ciria.org/ItemDetail?iProductCode=C790F&amp;Category=FREEPUBS&amp;WebsiteKey=3f18c87a-d62b-4eca-8ef4-9b09309c1c91">https://www.ciria.org/ItemDetail?iProductCode=C790F&amp;Category=FREEPUBS&amp;WebsiteKey=3f18c87a-d62b-4eca-8ef4-9b09309c1c91</a></p> <p>Funding in the form of grants, may be available to support the property owners in delivering PFR measures – see Section 5.1.</p>		
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### 5.3. Communities and Residents

These include Town/Parish Council, Flood Forum, Community Group, landowners and affected residents.

Create a Flood Warden Network to help coordinate the following:

- Preparing Household Emergency Plans for vulnerable properties in this area.
- Regularly inspecting ditches and pipework in the area of flood risk. Reporting blockages or other issues to the landowner and the LLFA.
- Explore options for property level protection and implement any recommendations. This could include additional drainage at properties, self-sealing air bricks and flood barriers.

Information on Flood Prevention measures for Home Owners, Communities and Businesses can be found on the Flood Toolkit:

[www.oxfordshirefloodtoolkit.com/risk/prevention](http://www.oxfordshirefloodtoolkit.com/risk/prevention)

Residents should check whether they are at risk of flooding by using the long term flood risk service [www.gov.uk/check-long-term-flood-risk](http://www.gov.uk/check-long-term-flood-risk). If they are at risk of flooding from rivers, seas or groundwater, they should sign up for flood warnings by visiting [Sign up for flood warnings - GOV.UK](http://Sign%20up%20for%20flood%20warnings%20-%20GOV.UK). The Met Office also offer a [weather warning alert service](http://weather%20warning%20alert%20service).

Permanent measures such as installing floodgates, raising electrical sockets and using flood resistant material when doing building work should be considered. Cherwell District Council, Oxfordshire County Council and the Environment Agency can provide advice on these matters and more information can be found at:

[www.oxfordshirefloodtoolkit.com/emergency/preparation](http://www.oxfordshirefloodtoolkit.com/emergency/preparation)

<https://nationalfloodforum.org.uk/>

Explore community wide solutions (e.g. attenuation areas, overflow routes, tree planting). Use the Flood Toolkit Funding Tool to find sponsors who may be willing to help fund improvement projects: [www.oxfordshirefloodtoolkit.com/risk/funding](http://www.oxfordshirefloodtoolkit.com/risk/funding)

Continue to report flood incidents to the Lead Local Flood Authority at: [www.oxfordshirefloodtoolkit.com/emergency/report-flood](http://www.oxfordshirefloodtoolkit.com/emergency/report-flood). Endeavour to obtain as much evidence of flood events as possible, such as photographic and video evidence.



Residents to explore obtaining Government subsidised flood insurance via Can Flood Re help me? <https://www.floodre.co.uk/>

#### **5.4. Lead Local Flood Authority (LLFA)**

LLFA team to work with the Joint Oxfordshire Resilience Team (JORT) and the EA to set up and support a community based Flood Warden Network.

Assist the JORT, the EA and other flood management authorities to support the community in the production of a Community Flood Plan and provide advice to residents on how to explore options for property level protection.

Inform owners of the drainage systems and watercourses within the overall surface water catchment area of their legal responsibilities.

Establish Multi Agency flood group meetings to discuss problems and to look at strategies to combat flooding due to Climate Change. Have periodic meetings with the local flood group to discuss the issues and recommendations with representatives from key authorities.

Work with CDC in looking at opportunities for schemes to manage flows upstream such as nature-based solutions through partnership working.

#### **5.5. Highway Authority (Oxfordshire Highways)**

Regularly check and maintain highway assets through Adderbury and the wider area in line with their current maintenance regimes. Add detailed information of the assets to the OCC Asset Register.

Assess the capacity of the highway assets with support from the LLFA and CDC to identify any areas with insufficient capacity for draining runoff from the highway. Where this leads to flood risk to properties improvement works must be considered.

Assess the suitability of third party drainage systems accepting discharge from Highway Drainage systems and report any unsatisfactory areas to the relevant Risk Management Authorities. Work with the community and LLFA to clarify ownership and maintenance responsibilities for watercourses, particularly where these are located within or near to the highway.

#### **5.6. Cherwell District Council**

Continue to consult with the Environment Agency and LLFA as required in respect of planning applications for new developments to reduce flood risk. Aim to ensure that all works are carried out in accordance with the approved plans and documents.

Review the planning policies relating to developments in the vicinity of the flooding incident, together with any flood risk assessments and drainage designs. Consider contacting the developers to take action in the event that any items relating to surface water drainage and flood risk are not evident or ineffective in the final developments or in the construction period.



Utilise their enforcement powers under Section 25 of the Land Drainage Act 1991 where it is considered that riparian owners are failing to maintain ordinary watercourses in their ownership.

Continue regular maintenance of their Ordinary Watercourse Assets, in line with current maintenance regimes.

Endeavour to assist other flood risk management authorities and landowners in the preparation of a detailed plan of assets relating to drainage and flood risk, to share with the LLFA and the community.

Support landowners to investigate private drainage and check for blockages and defects with remedial works to be carried out where necessary.

Continue to support homeowners and businesses in providing individual property level protection.

## **5.7. Landowners and Developers**

Developers should work with local authorities to ensure all development is completed in accordance with approved plans and documents, and planning policy.

Landowners should undertake regular inspection and maintenance of their drainage systems in accordance with a defined maintenance regime. Further, they should identify and develop a detailed plan of their assets to share with the LLFA, other flood risk management authorities and the community.

Landowners should assess the capacity of their drainage systems and identify any areas with insufficient capacity for the collection, conveyance, storage and disposal of surface water. Where this could lead to runoff to the public highway or nuisance to third party private property, improvement works should be considered.

Landowners who are riparian owners are responsible for carrying out work to maintain the natural flow of water in the relevant watercourse. Such work will include the removal of significant blockages and the removal of vegetation if it is causing premature flooding to third party land and or property.

Review the library of flood guides on the Oxfordshire Flood Toolkit.

([www.oxfordshirefloodtoolkit.com/planning/developers/](http://www.oxfordshirefloodtoolkit.com/planning/developers/) )

Agricultural landowners should carry out works to their land to reduce surface water runoff. These include following principles of good soil husbandry and providing land drainage systems such as ditches (<https://www.gov.uk/guidance/create-and-use-a-soil-management-plan>).

These works help to retain the natural land drainage regime and provide the best soil conditions for the continued agricultural use of the land. Examples of good practice for reducing surface water runoff from agricultural land are:

- Ploughing fields in a perpendicular direction to the slope of the land, reducing the effect of channelling of water over the land when it rains
- Using techniques and machinery to limit compaction of soils

- Growing crops that match the capability of the land, particularly in relation to the timings of activities and not overworking soils through the year
- Providing new ditches, sub-soil drainage and outfalls, and reinstating and regularly maintaining existing ditches. Old existing ditches may be completely filled and difficult to see. The type of soil make-up, type of flora and overall lie of the land can help to determine the routes of filled in historic ditches
- Preventing changes to the levels of the land that would cause channelling of surface water to a single point where this would not naturally occur.

It should be noted that following good practice for managing surface water runoff cannot completely remove the risks of natural land drainage and the associated quantities and flow routes of runoff that can cause flooding.

## 6. DISCLAIMER

The findings of the report are based on a subjective assessment of the information available by those undertaking the investigation and therefore may not include all relevant information. As such it should not be considered as a definitive assessment of all factors that may have triggered or contributed to the flood event.

Any recommended actions outlined in this FIR will be for the relevant responsible body or persons to assess in terms of resource implications, priority and cost/benefit analysis of the proposal. Moving forward, these may be included in the Action Plan linked to the Local Flood Risk Management Strategy or in the relevant risk management authority's future work programme as appropriate.

The opinions, conclusions and any recommendations in this Report are based on information provided to CDC and Oxfordshire County Council.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the time of preparation and CDC and Oxfordshire County Council expressly disclaims responsibility for any error in, or omission from, this report arising from or in connection with those opinions, conclusions and any recommendations.

The implications for producing Flood Investigation Reports and any consequences of blight have been considered. The process of gaining insurance for a property and/or purchasing/selling a property and any flooding issues identified are considered a separate and legally binding process placed upon property owners and this is independent of and does not relate to the information in this report highlighting flooding to properties at a street level.

Cherwell District Council or Oxfordshire County Council do not accept any liability for the use of this report or its contents by any third party.

## ACRONYMS

AEP Annual Exceedance Probability  
CDC Cherwell District Council  
OCC Oxfordshire County Council  
EA Environment Agency  
TW Thames Water  
FIR Flood Investigation Report  
F&WMA Flood and Water Management Act 2010  
LDA Land Drainage Act 1991  
LLFA Lead Local Flood Authority  
WRA Water Resources Act 1991

## USEFUL LINKS

### Highways Act 1980:

[www.legislation.gov.uk/ukpga/1980/66/contents](http://www.legislation.gov.uk/ukpga/1980/66/contents)

### Water Resources Act 1991:

[www.legislation.gov.uk/ukpga/1991/57/contents](http://www.legislation.gov.uk/ukpga/1991/57/contents)

### Land Drainage Act 1991:

[www.legislation.gov.uk/ukpga/1991/59/contents](http://www.legislation.gov.uk/ukpga/1991/59/contents)

**EA - Prepare your Property for Flooding:**

How to reduce flood damage Flood protection products and services

[www.gov.uk/government/publications/prepare-your-property-for-flooding](http://www.gov.uk/government/publications/prepare-your-property-for-flooding)

**EA - Long term flood risk service:**

<https://www.gov.uk/check-long-term-flood-risk>

**EA - Sign up for flood warnings:**

[Sign up for flood warnings - GOV.UK](http://Sign-up-for-flood-warnings-GOV.UK)

**EA - Up to date information on flood alerts & warnings:**

[Flood alerts and warnings - GOV.UK](http://Flood-alerts-and-warnings-GOV.UK)

**Oxfordshire County Council Flood and Water Management Web Pages:**

[www.oxfordshirefloodtoolkit.com](http://www.oxfordshirefloodtoolkit.com)

<https://www.oxfordshire.gov.uk/residents/fire-and-public-safety/emergency-planning/community-resilience>

**Flood and Water Management Act 2010**

<http://www.legislation.gov.uk/ukpga/2010/29/contents>

**USEFUL CONTACTS****Oxfordshire County Council Highways:**

Tel: 0345 310 1111

Website: [www.fixmystreet.oxfordshire.gov.uk](http://www.fixmystreet.oxfordshire.gov.uk)

**Environment Agency:**

General Tel: 08708 506 506 (Mon-Fri 8-6) Call charges

apply. Incident Hotline: 0800 807060 (24 hrs)

Floodline: 0345 988 1188

Email: [enquiries@environment-agency.gov.uk](mailto:enquiries@environment-agency.gov.uk)

**Thames Water**

Emergency Tel: 0800 316 9800 (select option 1)

Website: [www.thameswater.co.uk/help-and-advice/bursts-and-leaks/report-a-leak-orburst-pipe](http://www.thameswater.co.uk/help-and-advice/bursts-and-leaks/report-a-leak-orburst-pipe)